THE IRON AGE

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New York, Thursday, May 6, 1909.

The Greatest Steel Plant in the World.—IV.

The Shops at the Gary Works of the Indiana Steel Company, Subsidiary of the United States Steel Corporation.

Considered as a unit apart from the overshadowing greatness of the plant which they serve, the shops constituting the maintenance department of the Gary Works comprise a group that would anywhere be regarded as of commanding industrial importance, not only on account of its imposing size, but because of the extent, capacity and completeness of its equipment. Although relatively inconspicuous in comparison with the vast proportions of the steel works proper, these shops severally and collectively play an important part in the general scheme of operations; they are, in fact, an indispensable adjunct to the plant.

The leading members of the group, such as the machine, blacksmith and boiler shops, were the first of all the buildings erected and equipped, having been completed and running for over a year. In the meantime these and the others since built have greatly facilitated the work of construction, their capacity being not only equal to the handling of ordinary repair work, but sufficient even for the incidental rebuilding of equipment.

While not much of radical departure from usual modern practice is to be found in the design and construction of these shops or in the tools and machinery comprising their equipment, they offer an interesting example of a comprehensive adaptation to a given end. The probable need of future extension was a factor duly considered in the original plan for all of the shops, and they were accordingly laid out to meet this requirement without disarrangement of the present co-relation of the several units. In the outline plan drawing of the plant as a whole, shown in the issue of *The Iron Age* of January 7, 1909, the locations of the various shops are indicated. A portion of this plan, on a little larger scale, is herewith given in Fig. 1.

The General Arrangement of the Buildings.

With the exception of the roll shop and the "square" round house, as the locomotive shop is called, the entire group is ranged on either side of the main avenue leading into the plant, which is an extension and the northern terminus of Broadway, the principal north and south street of the town of Gary. On one side of the street, at the entrance of the plant proper, are the machine shop, foundry, storehouse, paint shop and brick shed; on the other, the boiler shop, blacksmith shop, electric repair shop, pattern shop, pattern storage house and clock house, all ranged from north to south in the order named.

The switch tracks connecting the shop with the main yard system are arranged to afford convenient facilities for handling material in and out and between the shops, all of them being paralleled on either side by continuous tracks connected at either end with the main east and west trunk lines of the plant system. In addition to these, switch tracks enter the machine shop, boiler shop, foundry, electric repair shop and storehouses, in the former two of which the line is continuous through the center of both shops.

The handling and transfer of heavy material are further facilitated by tram tracks leading from the shops to the outside switch line. These trams are all the more convenient and effective, since the intervening spaces between the principal members of the group are covered by electric traveling cranes mounted on yard runways. Between the machine and boiler shops and foundry and blacksmith shop the runway is continuous, extending across the street, thus supplementing the means of transfer between all four shops. It would be difficult to devise an intertransit system for shop traffic purposes more complete than is here laid out.

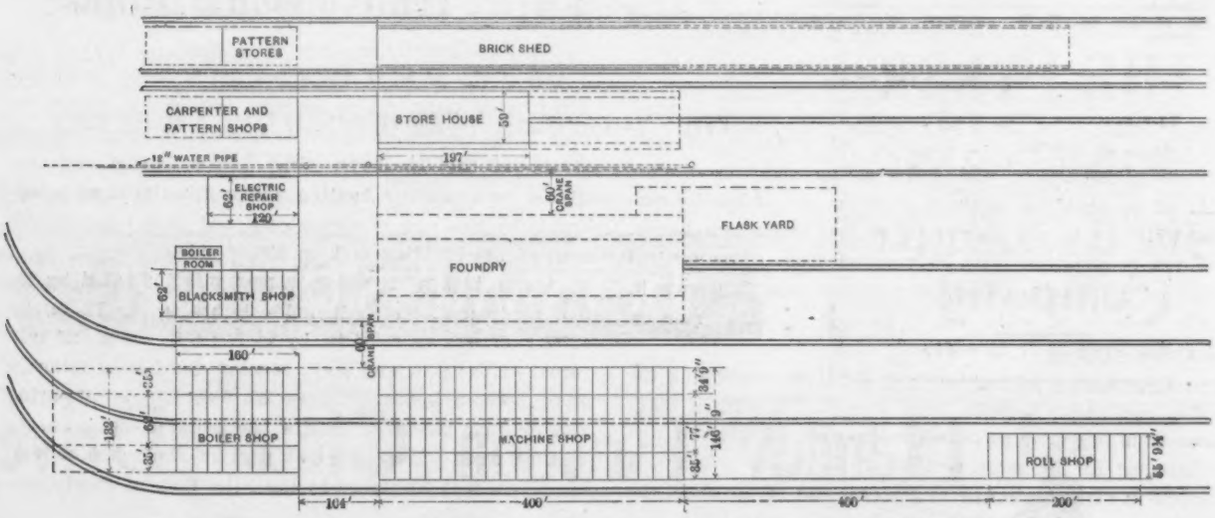


Fig. 1.—Location Plan of the Shops, Stores and Foundry of the Indiana Steel Company.

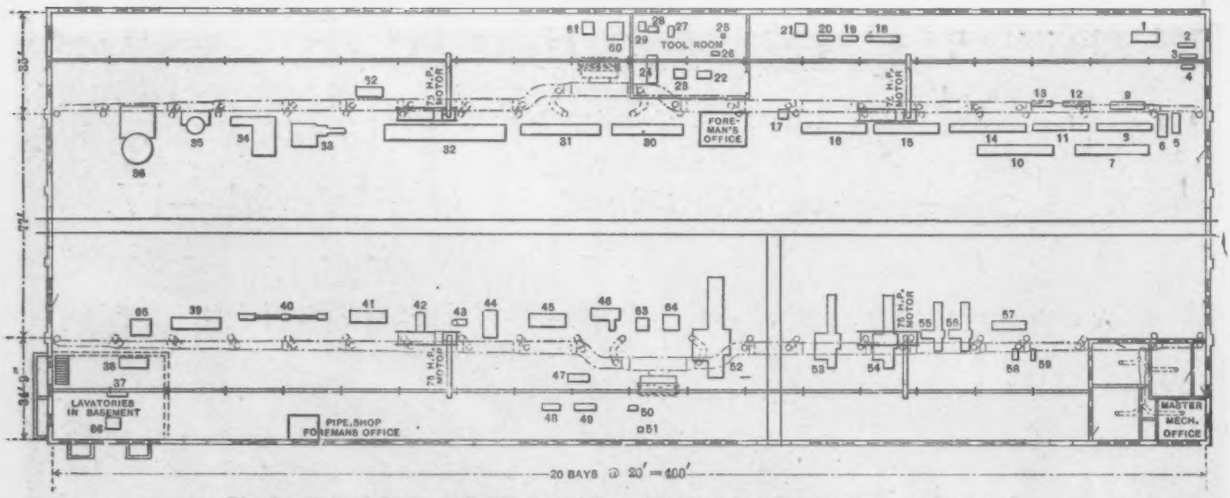


Fig. 2.—Ground Plan of the Machine Shop.—The Tools as Numbered Are as Follows:

1. Screw machine.
2. 3¼-in. cutting off machine.
3. 6-in. centering machine.
4. 4-in. centering machine.
5. 2-in. twin bolt threader.
6. 3-in. bolt threader.
7. 24 in. by 25 ft. lathe.
8. 30 in. by 11 ft. lathe.
9. 24-in. turret lathe.
10. 24 in. by 20 ft. lathe.
11. 30 in. by 12 ft. lathe.
12. 21-in. turret lathe.
13. 18 in. by 10 ft. lathe.
14. 30 in. by 20 ft. lathe.
15. 36 in. by 15 ft. lathe.
16. 36 in. by 15 ft. lathe.
17. Emery grinder.
18. 18 in. by 10 ft. engine lathe.
19. 14 in. by 5 ft. engine lathe.
20. 14 in. by 5 ft. engine lathe.
21. 24 x 24 in. planer.
22. 10 x 19 x 36 in. universal miller.
23. 12 x 20 x 36 in. universal miller.
24. 72-in. gear cutter.
25. Emery grinder.
26. 20-in. drill press.
27. 15-in. shaper.
28. 10 in. by 5 ft. engine lathe.
29. Milling cutter grinder.
30. 42 in. by 15 ft. lathe
31. 48 in. by 20 ft. lathe.
32. 72 in. by 31 ft. lathe.
33. 80-in. horizontal boring machine.
34. Horizontal boring, drilling and milling machine.
35. 6-ft. boring mill.
36. 10 to 16 ft. boring mill.
37. Pipe threader.
38. Pipe threader.
39. Double axle lathe.
40. 300-ton wheel press.
41. 24-in. slotter.
42. Vertical key seater.
43. 36-in. vertical boring mill.
44. 12 in. by 5 ft. keyway cutter.
45. 6-ft. heavy radial drill.
46. 6-ft. universal radial drill.
47. 30-in. drill press.
48. 30-in. drill press.
49. 30-in. drill press.
50. 20-in. drill press.
51. Emery grinder.
52. 84 x 84 in. planer.
53. 48 x 48 in. planer.
54. 48 x 48 in. planer.
55. 36 x 36 in. planer.
56. 36 x 36 in. planer.
57. 26 in. by 10 ft. traveling shaper.
58. 16-in. shaper.
59. 16-in. shaper.
60. 72-in. Gleason gear planer.
61. 48-in. Gleason gear planer.
62. Horizontal boring and drilling machine with 8-ft. table.
63. 4-ft. plain radial drill press.
64. 5-ft. plain radial drill press.
65. 4 to 12 in. pipe cutting and threading machine.
66. ¼ to 4 in. pipe cutting and threading machine.

The Machine Shop.

The machine shop, shown in plan and section in Figs. 2 and 3, is housed in a building 147 x 400 ft., of steel frame construction, with brick siding and tile roofing. All of the buildings in the main group are of similar construction with the exception of the brick storehouse, which is sheathed with corrugated iron. The central bay of the machine shop, of which a view is shown in Fig. 4, is 77 ft. wide, and is flanked on either side by lean-tos, each 35 ft. in width.

A systematic arrangement of the tools comprising the shop equipment includes their grouping in such a manner as to assemble as nearly as possible all work of like character in the same section of the floor. With this object in view, beginning at the east end of the shop, the lathes are arranged on the right of the central bay, and are followed in order by the heavy boring mills. On the opposite side of the bay, in like position, are located the planers and shapers, the drill presses, key setting and slotting machines, axle lathes and pipe threading machines.

This arrangement affords a wide, clear space through the entire length of the shop for erecting, loading and handling, which work is facilitated by a 25-ton traveling crane with a 5-ton auxiliary commanding the main floor. The space in the side bays is occupied by smaller tools for lighter work.

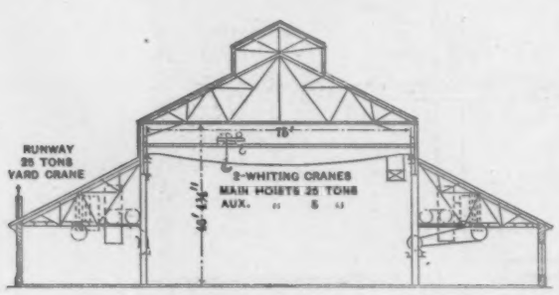


Fig. 3.—Transverse Section of the Machine Shop.

All of the tools, except a few of the larger machines fitted with independent motors, are group driven by four 75-hp. motors connected to line shafts hung from the girders of the side bays. The shop is heated and ventilated by a hot air heating and ventilating system operated by two sets of steam coils and fans located midway of the building and on either side.

A fair idea of the shop capacity is indicated by its tool equipment, which includes lathes up to 72 in. by 42 ft.; planers up to 84 in. by 18 ft.; 6-ft. plain and universal drills; 6-ft. and 10-ft. turning and boring mills; a 96 in., 300-ton, hydraulic press; an 80-in horizontal boring and drilling machine, besides the usual complement of smaller tools. The principal part of the machine tool equipment was furnished by the Niles-Bement Pond Company.

The Boiler Shop.

Facing the machine shop, on the opposite side of the street, is the boiler shop, 133 x 160 ft., with a hight of 43 ft. 4 in. from floor to the roof chords in the main section, which is 63 ft. wide. The plan and section are shown in Figs. 5 and 6. In addition to a 15-ton traveling crane covering the center bay, of which a view is given in Fig. 7, there are a number of wall cranes serving the principal machines.

The tool arrangement is designed to promote a continuous order of operations. Entering the shop at the east end over the switch track, or brought in on the tram car from the stock yard on the south side, material passes first to the shears and thence to the punches on one side, and from there is carried over by crane to the bending rolls and forming machines on the other side. A clearance of 25 to 30 ft. between the swing of the jib cranes affords space through the center of the shop for riveting and erecting work. The side bays, each 35 ft. wide, are utilized for laying out and fitting and for lighter work.

Compressed air for the operation of pneumatic tools is supplied by an Ingersoll-Rand twin compressor, driven

Fig. 4.—View in the Main Bay of the Machine Shop Looking Westward.

by a 120-hp. Westinghouse synchronous motor. A heating and ventilating system similar to that in the machine shop provides an even and comfortable temperature throughout the shop.

The term boiler shop as applied to this department is somewhat of a misnomer, since the boiler work required about the plant is relatively small. Gas superseding steam, as a means of generating power, limits the use of boilers to auxiliary power service, heating and other miscellaneous requirements, so that there are comparatively few boiler units in actual operation. Of these the yard locomotive boilers comprise the greater number. All of the stationary boilers about the plant are of the water tube type, and the repair work incident to their maintenance calls for but little boiler work in this shop which is now more commonly referred to as the structural shop. Prior to the starting of the blast furnaces, and later the open hearth furnaces and rail mill, it was chiefly employed in getting out miscellaneous structural jobs in connection with construction of the various plant

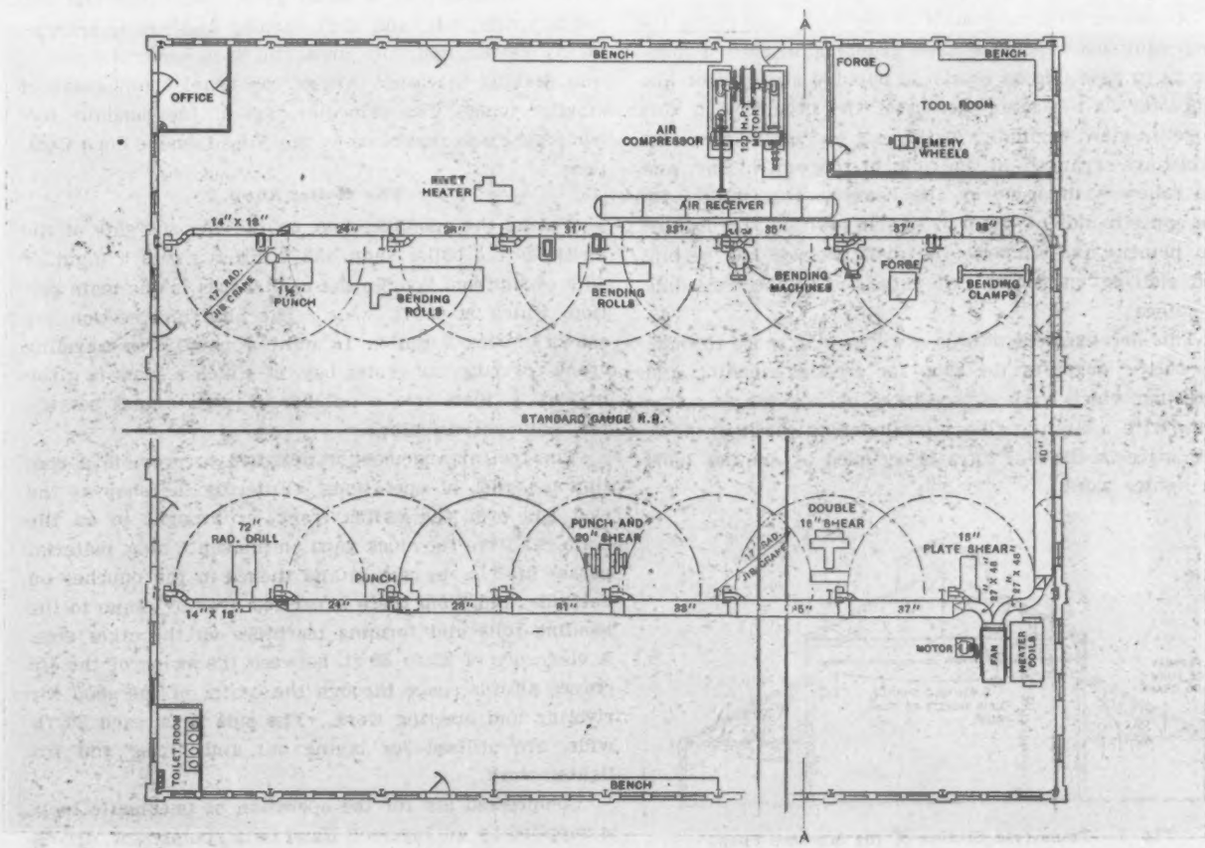


Fig. 5.—Ground Plan of the Boiler Shop.

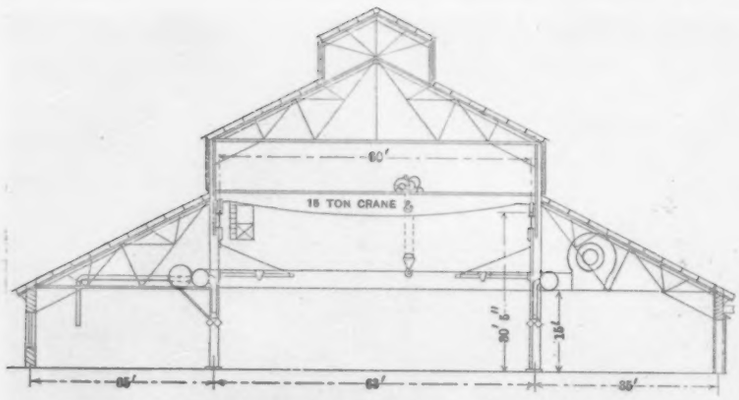


Fig. 6.—Transverse Section of the Boiler Shop Through A A on Fig. 5.

buildings. It will, however, as plant operations extend, be largely employed in the repair of ladles.

Its tool equipment is adequate for a wide range of heavy work in plates and structural construction, being equal to any demands likely to be imposed upon it either in repairs or new construction. Extraordinary care has been exercised in providing safeguards against accidents likely to result in personal injury to workmen through contact with machinery. Gear wheels and other moving parts of all tools are, as far as possible, completely inclosed in metal shields. There are no line shafts in the shop, each tool being driven by an independent motor mounted upon the machine itself.

The Blacksmith Shop.

Opposite the boiler shop is the blacksmith shop, 62 x 160 ft. in its main section, with an ell 31½ x 60 ft. It is shown in plan and section in Figs. 8 and 9. The stock yard between the blacksmith and boiler shops is spanned by a traveling crane, and connection between the two is provided by a tram track extending to the center of each shop. From the switch track traversing the yard, material is unloaded on either side or picked up at any point in the yard by cranes and deposited on the tram car for transfer into the shop. The forges, of which there are 11 ranged along the sides of the shop, are of the down-draft type, which do away with the smoke and gas arising from ordinary open forges. They are operated by two motor driven fans, one for blast and one for exhaust, the pipes being all run under the floor.

Occupying the middle of the shop from front to rear, Fig. 10, are the heavy tools, which include two steam hammers of 1 and 3 tons capacity each, with provision for a third of 2 tons capacity, a large double end punch and shear and two single punches. Liberal space is provided between each of these machines for the handling of work. An electric crane with 20 ft. headroom spans the floor from end to end. In the east end of the building are installed a bolt cutter and two bolt headers, and a bulldozer, all motor driven, and a bolt heating furnace.

A battery of two Sterling boilers, housed in the ell portion of the building, produces steam for driving the steam hammers—the only steam driven tools in all the group—and for supplying steam heat to other shops. A large heating furnace for the heavier work is located partly in the main shop and partly in the boiler room; the furnace doors open into the former, and it is fired on the other side from the boiler room firing floor. The coal bin is conveniently accessible to both the boilers and furnace, and is filled direct from cars on a coal track outside.

The Foundry.

No unit of the shops is better designed or more fully equipped for the service required than is the foundry plant. The foundry building, which in design and construction is similar to the machine shop, and which it parallels on the south, is 137 x 400 ft. It is shown in plan and section in Figs. 11 and 12. The molding floor, Fig. 13, occupies the entire middle bay, 61 ft. in width, and is served by three overhead electric cranes of 25, 40

Fig. 7.—View from the Side Bay of the Boiler Shop Looking Into the Central Bay on the Right.

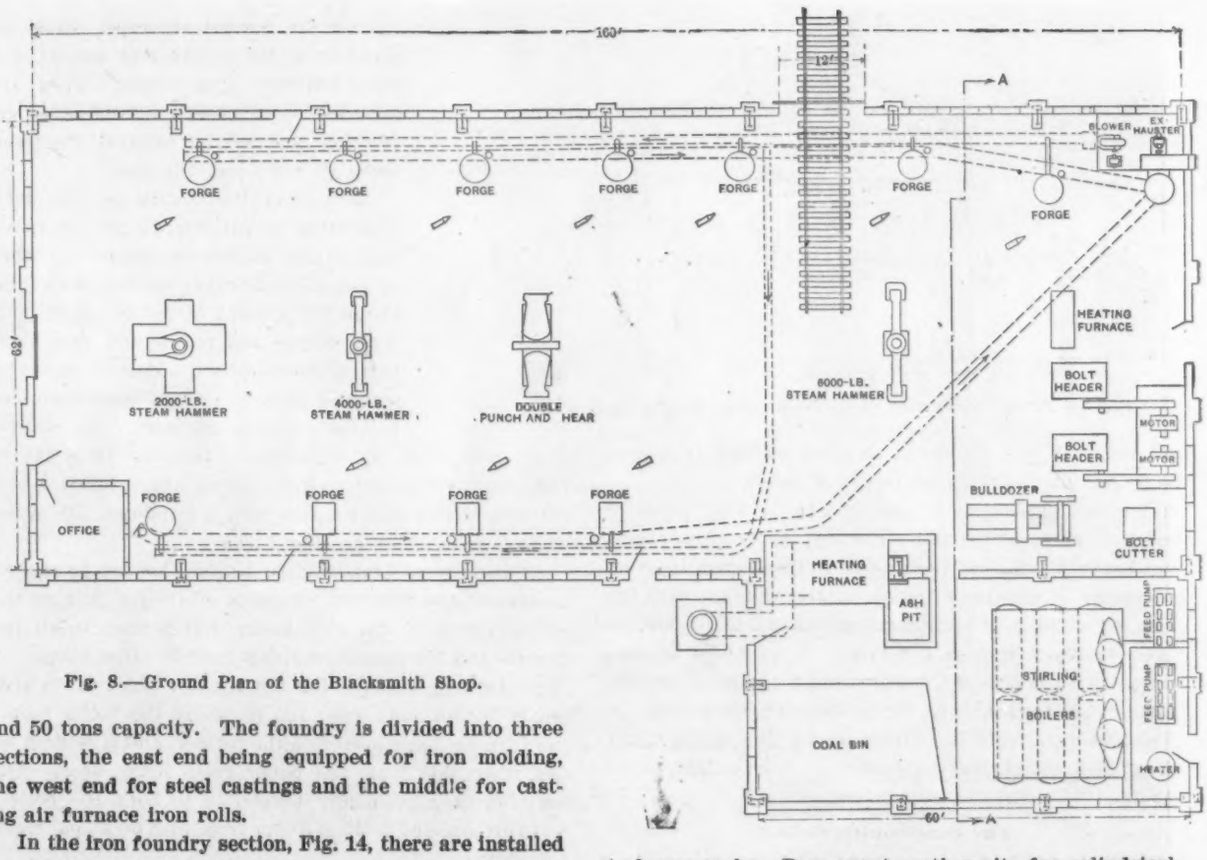


Fig. 8.—Ground Plan of the Blacksmith Shop.

and 50 tons capacity. The foundry is divided into three sections, the east end being equipped for iron molding, the west end for steel castings and the middle for casting air furnace iron rolls.

In the iron foundry section, Fig. 14, there are installed one 72-in. and one 46-in. cupola to which blast is delivered by two electric driven blowers. In this section is also a 750-lb. Schwartz furnace, used for aluminum and brass castings. Oil fuel is used for this furnace and is fed from a tank on an elevated steel platform outside the building. In the brick inclosed room to the west of the cupolas in the same bay, provision is made for the installation of two 15-ton air iron furnaces for roll castings, which have not yet been put in. In the meantime this room serves as a flask repair room.

At the extreme west end of this bay is located a 25-ton acid open hearth steel furnace, Fig. 15, for the making of steel castings; a Morgan gas producer plant installed in an adjoining building on the outside supplies gas for the operation of this furnace. In the northern bay, and near the middle of the building, are four 18 x 24 ft. brick core ovens, Fig. 16. These are furnished with rolling steel curtains, and each accommodates two truck mounted steel core racks. Permanent casting pits for cylindrical work are located at each end of the molding floor convenient to the steel furnace at one end and the cupolas at the other. Owing to the sandy character of the soil these are first lined with steel casing. One in the iron foundry, just being installed, is 11 ft. in diameter by 10 ft. deep.

Supplementing the overhead cranes and mounted on a runway beneath them on the north side of the molding floor are two 5-ton Morgan traveling wall cranes with a reach of 17 ft. Two 5-ton cranes span the north bay with sufficient head room to clear the core ovens over which they pass. Charging material for the cupolas is hoisted from the stock yard on the south side of the foundry to an outside steel platform on a level with the charging

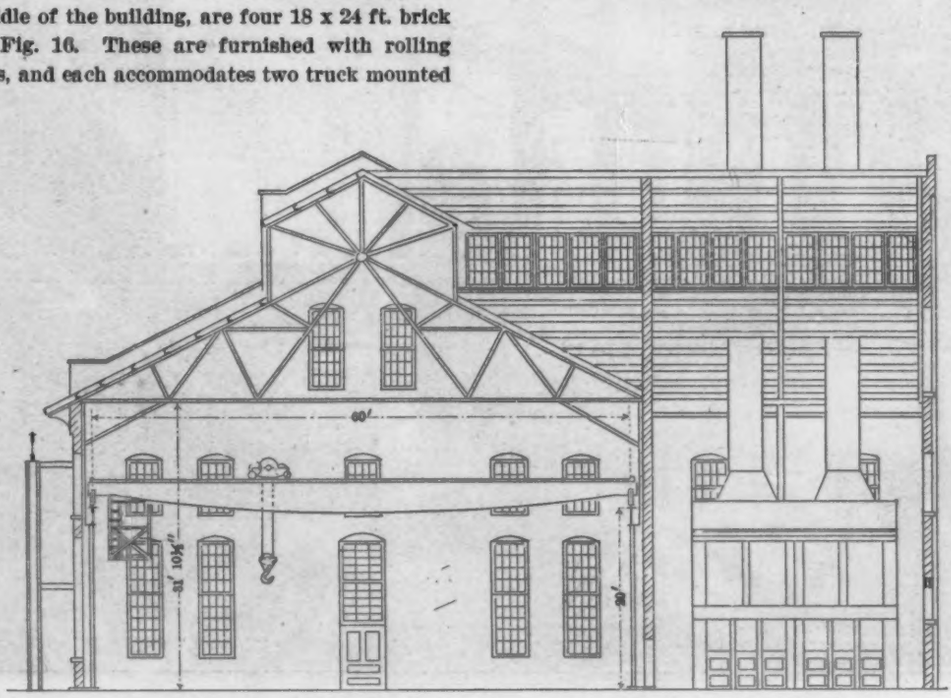


Fig. 9.—Transverse Section of the Blacksmith Shop Through A A on Fig. 8.

Fig. 10.—View in the Blacksmith Shop Looking Westward.

Fig. 13.—View in the Foundry Looking Westward from the Main Entrance.

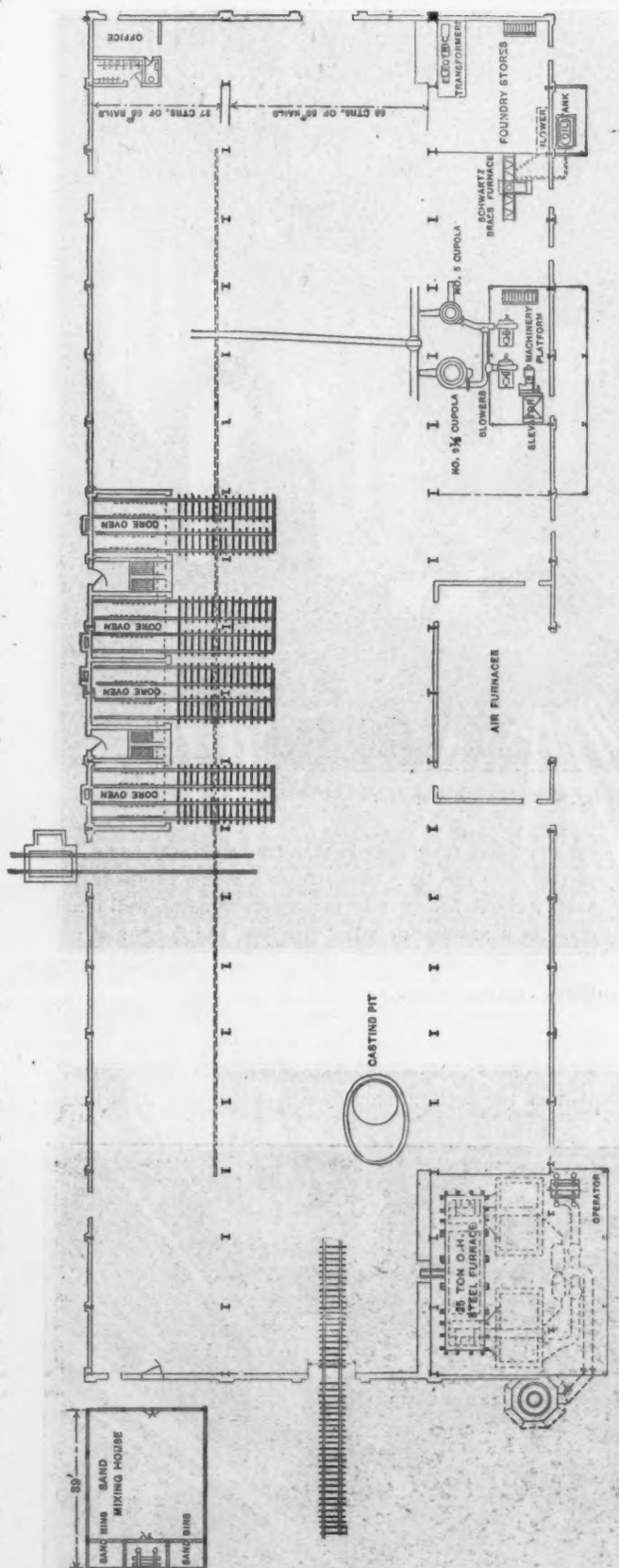


Fig. 11.—Ground Plan of the Foundry.

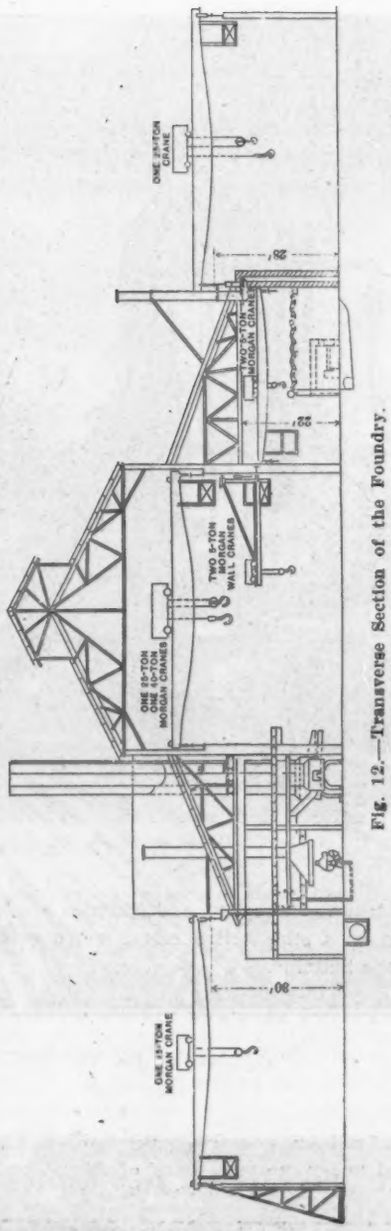


Fig. 12.—Transverse Section of the Foundry.

room by a 25-ton yard crane spanning the yard switch track the full length of the building. Auxiliary to this service is a 10-ton Otis electric elevator within the building, on the yard side, running to the charging floor. Owing to the probable extension of the foundry building, the sand bins and mixing and screening machines are located in a temporary structure of corrugated iron at the west end of the foundry which can easily be removed.

The Electrical Repair Shop.

The electrical repair shop, though not as large as some of the others, is by no means one of minor importance. The use of electricity as the almost universal motive power of the steel plant naturally increases the scope of work in this department, which is charged with the responsibility of keeping the transmission system and motive machinery in order. In the shop group alone there is 2440 hp. of electric motor equipment, in which is included that of 15 cranes, one of which, with 24 ft. overhead clearance and 10 tons capacity, spans the floor of this shop, which is located between the blacksmith and pattern shops.

The electrical repair shop is shown in plan and section in Figs. 17 and 18. It is 60 x 120 ft., with a 14-ft. gallery on one side, the latter being also served by the traveling crane. The plan of the gallery is shown in Fig. 19. The machinery equipment on the main floor, of which a view is given in Fig. 20, includes three lathes—one single, one three-spindle and one radial drill—milling machine, shaper, two grinders and an open forge. All are group motor driven. A line of work benches set endwise against the north wall occupies part of the space underneath the gallery.

While at present some repair parts are purchased, it is the intention ultimately to do all the repair work in this shop. It is fitted to rewind all motors, and to do practically any kind of work outside of new construction of motors and generators. Light work, such as winding, testing and repairing lamps, is done in the gallery in which are installed a winding machine, paper cutter and

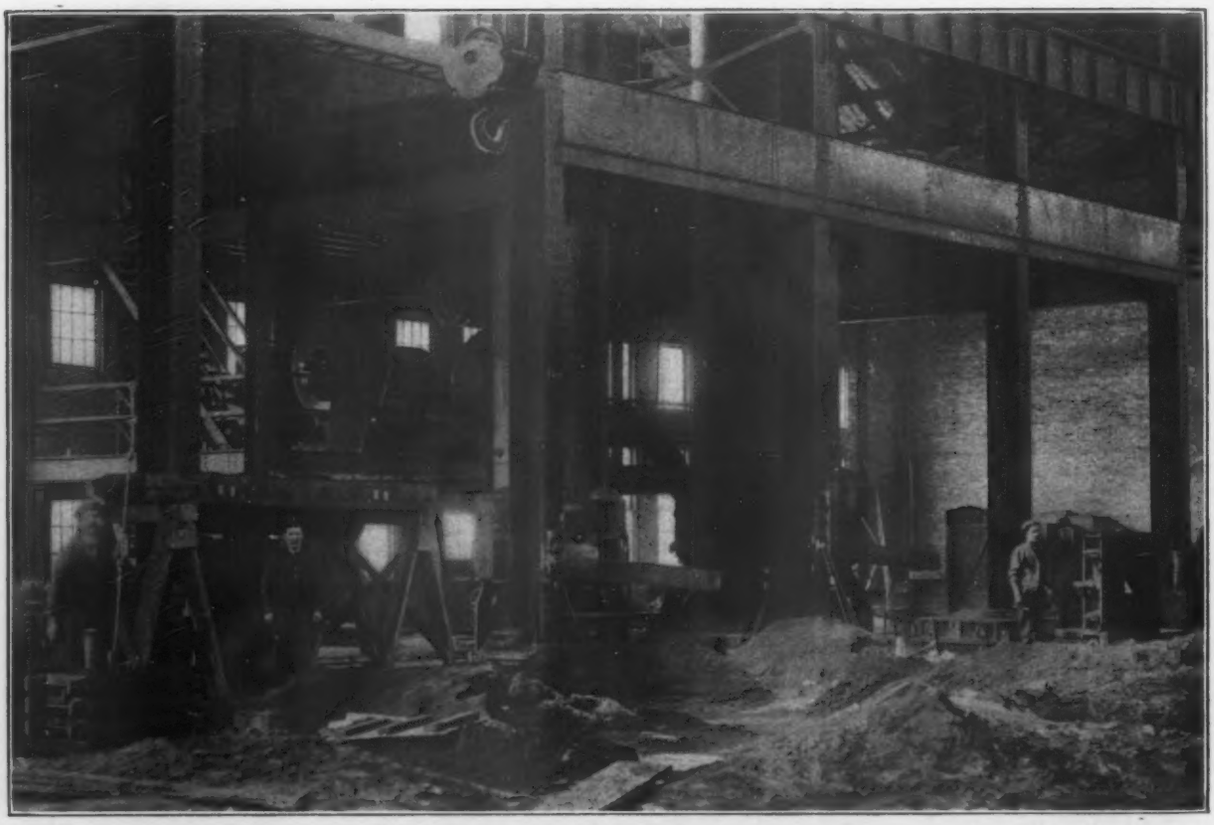


Fig. 14.—View in the Foundry, Showing the Cupolas.

work benches. Machinery and material are brought into the shop on a stub switch track, which enters the east end of the building.

The Pattern Shop and Pattern Storage House.

The pattern shop is a two-story structure, 51 x 99 ft., shown in plan and section in Figs. 21, 22 and 23. It is furnished with a complete equipment of standard woodworking machines adapted to the making of patterns for light and heavy castings, many of the latter being called for to replace breakages in massive machinery parts. All of the tools are belt driven from a single overhead line shaft on each floor run by motors mounted on wall brackets. As a provision against fire loss, the floors and ceilings are of concrete, there being no openings in the upper floor.

The second story is reached by an outside stairway; a similar provision marks the construction of the pattern storage house, the second floor of which is connected with that of the pattern shop by a steel bridge. This house,

Fig. 15.—The Pouring Side of the 25-Ton Acid Open Hearth Steel Furnace in the Foundry.

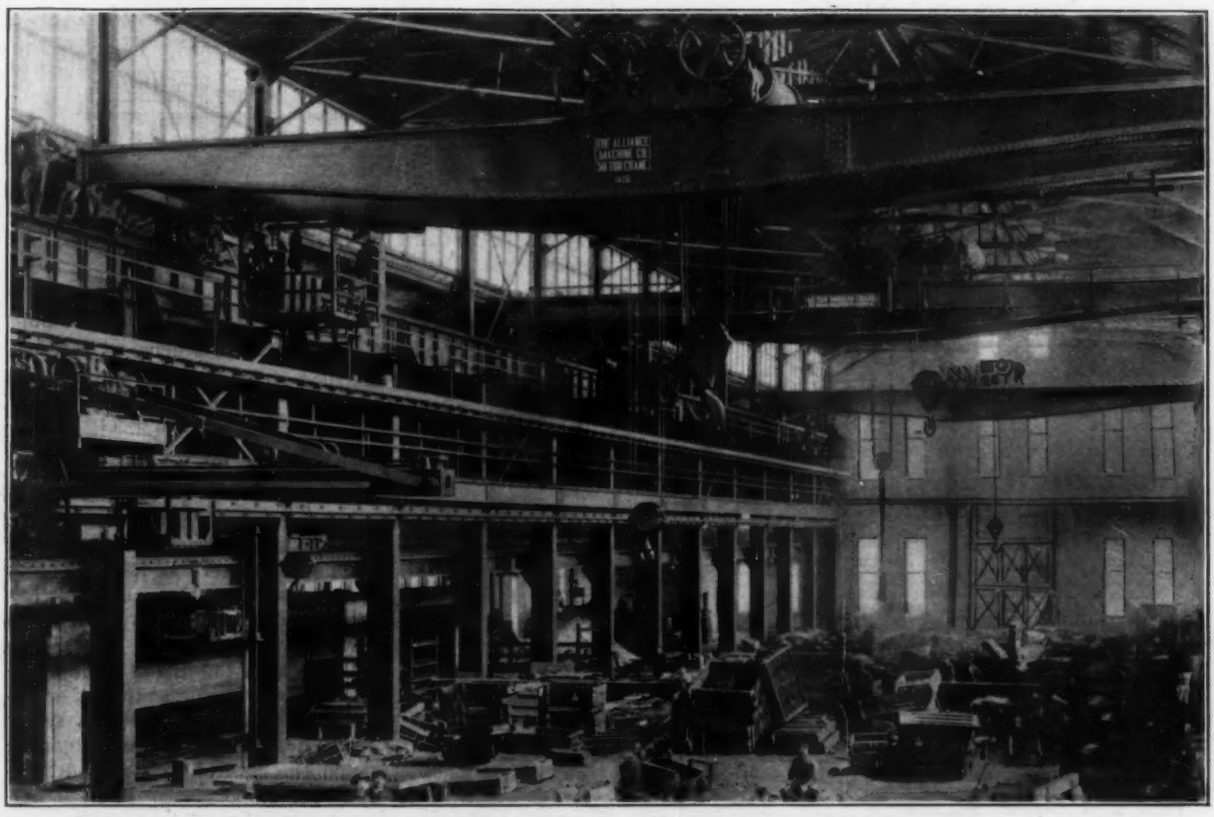


Fig. 16.—View in the Foundry Looking Eastward, the Core Ovens Being on the Left.

50 x 120 ft., shown in plan and section in Figs. 24 and 25, has four floors covered with pattern storage racks. A 6 x 10 ft. electric elevator, running in a shaft outside of the building, reaches each floor, besides which there is an outside steel stairway of four flights. The only openings in the building, aside from the fireproof doors at the stair and elevator landings, are 18 in. square ventilator ports covered by top hinged cast iron plates, all of which can be closed from the ground. The lighting system is similar to that used in vaults, whereby all lights are automatically turned off by closing the doors. As a further protection against fire, it is intended to install a complete automatic sprinkler system in both the pattern shop and storage house.

The Roll and Locomotive Repair Shops.

At a distance of 150 yd. west of the machine shop and foundry are placed the roll shop and locomotive repair shop. The former occupies a one-story building, which at present is 200 ft. long by 60 ft. wide, but when the finishing mills are in operation it will doubtless be enlarged to double its present capacity. It is shown in plan and section in Figs. 26 and 27.

The roll shop equipment consists of two 60, four 44 and three 34 in. independent motor driven roll lathes made by the United Foundry & Engineering Company. They occupy the northern side of the building, where they are set at right angles with its length, spaced 7 to 8 ft. apart. About one-third of the floor space is used for

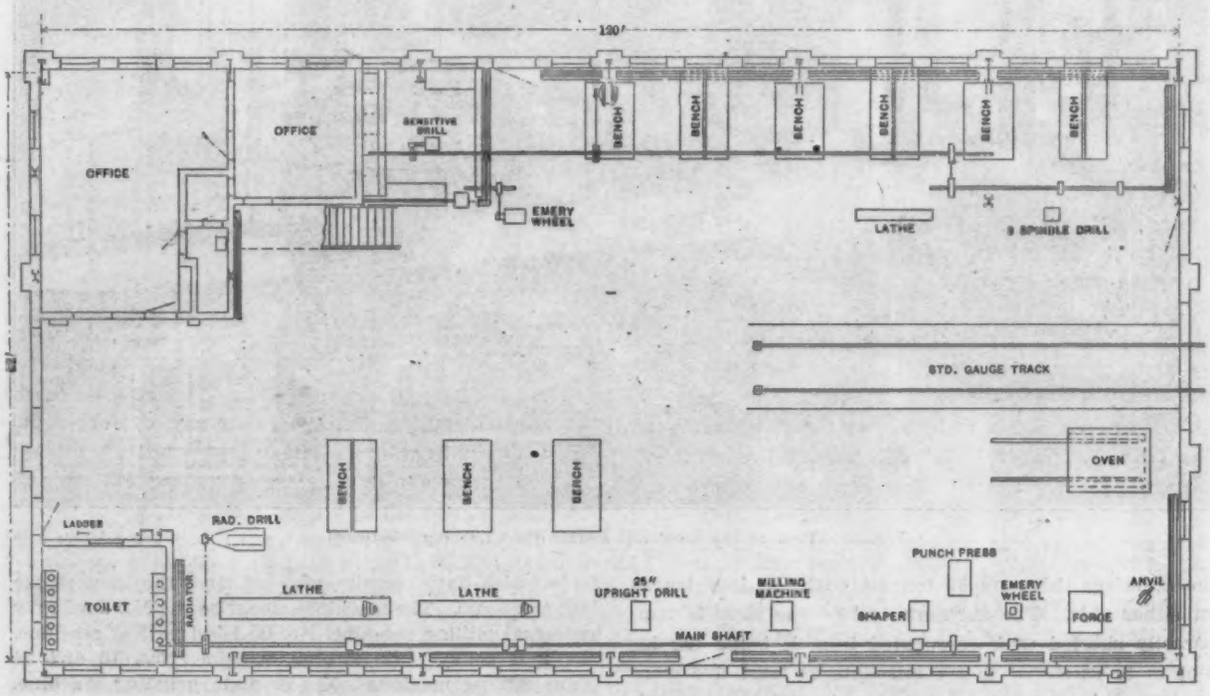


Fig. 17.—Plan of the Main Floor of the Electrical Repair Shop.

roll storage. Rolls are switched into the building over a stub track entering the building at the west end, and are lifted from the car by a 15-ton crane which spans the entire floor with 20 ft. clearance and are deposited in the roll racks or carried to the lathes.

Instead of the usual round house construction, a shop rectangular in shape, 104 x 259 ft. in dimensions, has been provided for the repair of locomotives. The shop lies within and is paralleled by the tracks of a switch loop

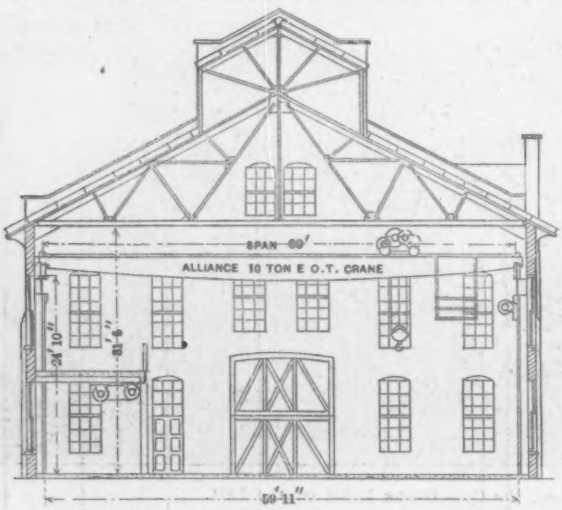


Fig. 18.—Transverse Section of the Electrical Repair Shop.

connected at either end with the main yard system. It is traversed diagonally by seven tracks, all of which are covered by a 50-ton crane of 50-ft. span. Passing through the buildings these tracks connect with the loop tracks on either side. The northern end of the shop is temporarily sheeted with corrugated iron, it being the intention to extend it to accommodate at least five more tracks. This form of construction, it will be observed, does away with the necessity for turntables.

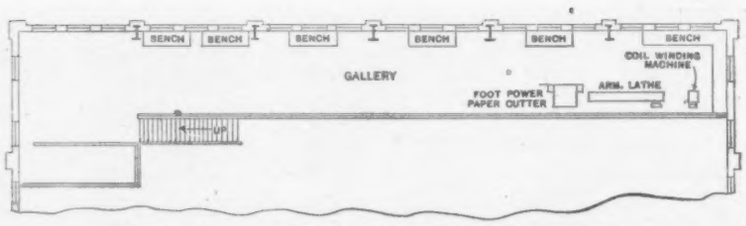


Fig. 19.—Plan of the Gallery of the Electrical Repair Shop.

Other buildings in the shop section include the storehouse, brick shed and clock house, all of which are built to fit in and conform to the general scheme of arrangement as laid out in the plan embracing the maintenance department group.

The New Brown & Sharpe Catalogue.

The Brown & Sharpe Mfg. Company, Providence, R. I., has issued its 1909 catalogue in the usual handbook form and containing full information concerning the company's comprehensive line of products. The volume contains 551 pages. General speaking, its contents may be divided into two sections, machinery and tools. In the former are set forth with copious illustrations the line of milling machines and attachments and appurtenances; that of grinding machines and attachments; the gear cutters, screw machines, automatic turret forming machines, automatic cutting off machines; and the several tools and attachments which go to make the scope of the different machines complete. Various semi-special machines are shown, and annealing and case hardening furnaces, pumps, &c. The Brown & Sharpe cutters and gears are too well known to receive more than passing mention; the catalogue goes into them in much detail. The last section of the book is given over to the small tools.

A colored insert is devoted to the new machines and tools which have been brought out since the issue of the last catalogue. The machines comprise the No. 2 A heavy universal milling machine, No. 00 hand milling machine, No. 2 B heavy plain milling machine, Nos. 13 and 24 plain milling machines, No. 12 plain grinding machine, No. 23 gear cutter grinding machine, No. 12 automatic gear cutting machine and No. 2 G automatic screw ma-

Fig. 20.—View in the Electrical Repair Shop Looking Westward.

chine. The new features include a large number of machine attachments, reamers and machinists' tools. As usual, the catalogue is a textbook of useful information, containing much that must be helpful to engineers and mechanics.

The city of Brazil, Ind., with 12,000 population, and situated in the heart of the coal district of the State, has set out to increase its population to 25,000, and has engaged Charles S. Hernly to lead the movement. Mr. Hernly had much to do with building up Newcastle, Ind., where he lives, as one of the chief industrial centers of the State. His plan is the location of factories. The city has raised in a few weeks $45,000 of a contemplated factory fund of $150,000.

The Mortality Rate in Dusty Trades.

Frederick L. Hoffman, statistician of the Prudential Insurance Company, Newark, N. J., has contributed an article to the bulletin of the Department of Commerce and Labor on the mortality from consumption in dusty trades. The number of occupations considered is 42, divided into four groups, according to the exposure of the workers from metallic, mineral, vegetable fiber or animal and mixed fiber dust.

The article states that of the deaths from all causes among males 15 years old and more in the United States 14.8 per cent. were from consumption. According to industrial insurance experience, the ratios were 36.9 per cent. for occupations exposed to metallic dust, 28.6 per

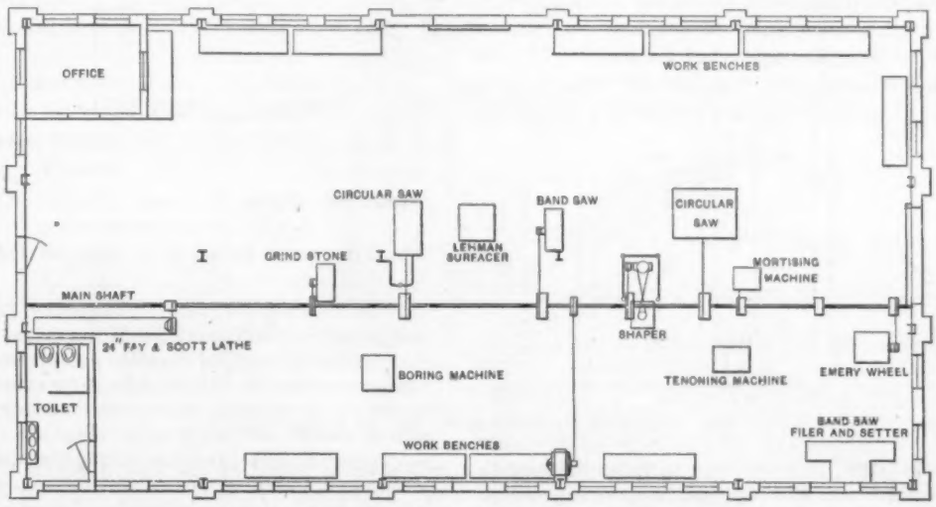


Fig. 21.—Plan of the First Story of the Pattern Shop.

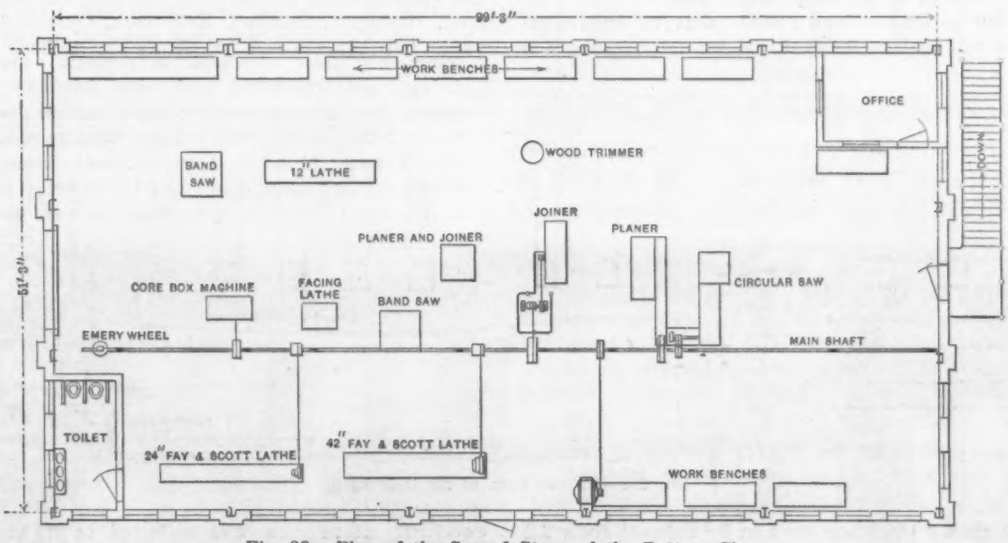


Fig. 22.—Plan of the Second Story of the Pattern Shop.

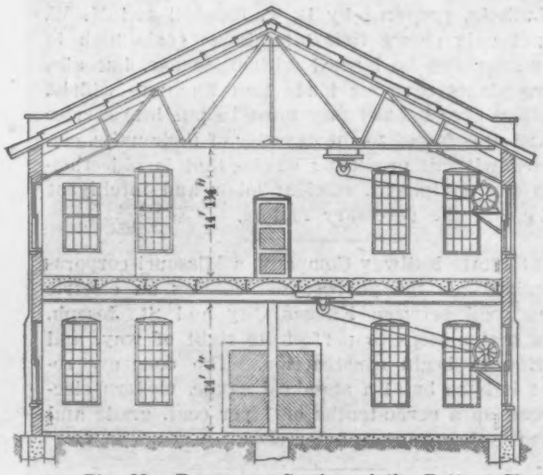


Fig. 23.—Transverse Section of the Pattern Shop.

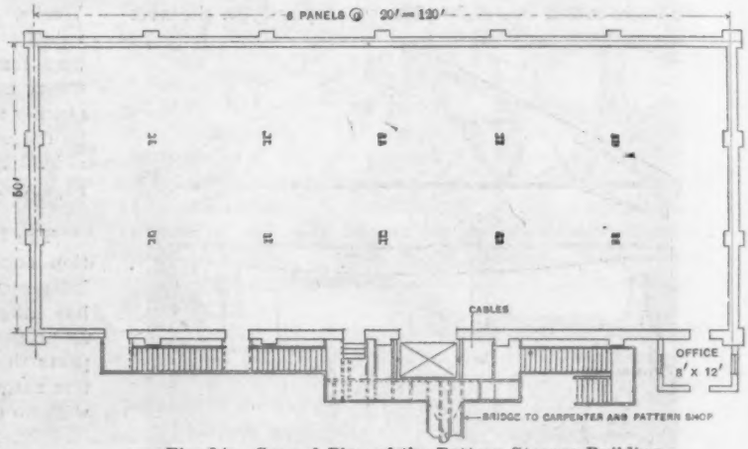


Fig. 24.—Ground Plan of the Pattern Storage Building.

cent. for those exposed to mineral dust, 24.8 per cent. among those exposed to vegetable fiber dust, and 32.1 per cent. for those exposed to animal or mixed fiber dust.

The occupation showing the highest percentage of mortality was that of grinders, among whom 49.2 per cent. were from consumption. In each occupation group the highest mortality from consumption was among persons between the ages of 25 and 34, the proportion of deaths between those years being 57.2 per cent. in occupations exposed to metallic dust, 47.6 per cent. in those exposed to mineral dust, 53.9 per cent. in those exposed to vegetable fiber dust, and 53.3 per cent. in those exposed to animal and mixed fiber dust, as compared with 31.3 per cent. for all males in the registration area.

It is the opinion of the author that by intelligent methods of ventilation and dust removal the consumption death rate among wage earners can be reduced from 2.2 per 1000, the rate based on the number of deaths among gainfully employed persons 10 years of age and over in the registration States in 1900, to 1.5 per 1000, the average rate for 200 small cities, as shown in the mortality statistics of the United States census for 1901 to 1905.

Such a reduction, the author estimates, would result in an annual saving of 22,238 human lives and would add 15.4 years of life for every death from consumption avoided by rational conditions of industrial life. Such a gain would represent a total of 342,465 years of additional lifetime, and by just so much the industrial efficiency of the American nation would be increased.

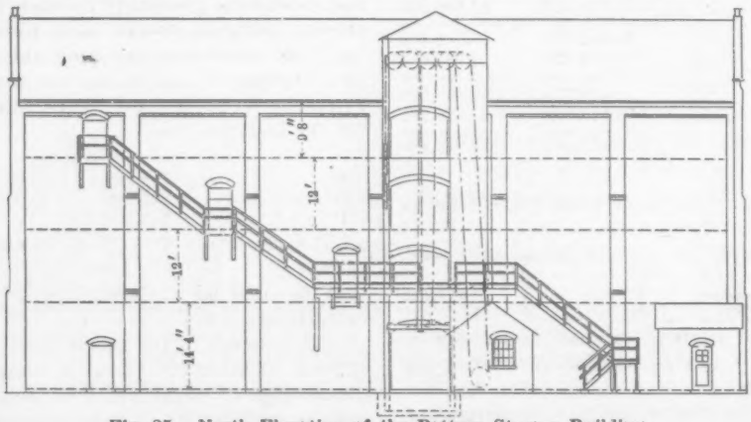


Fig. 25.—North Elevation of the Pattern Storage Building.

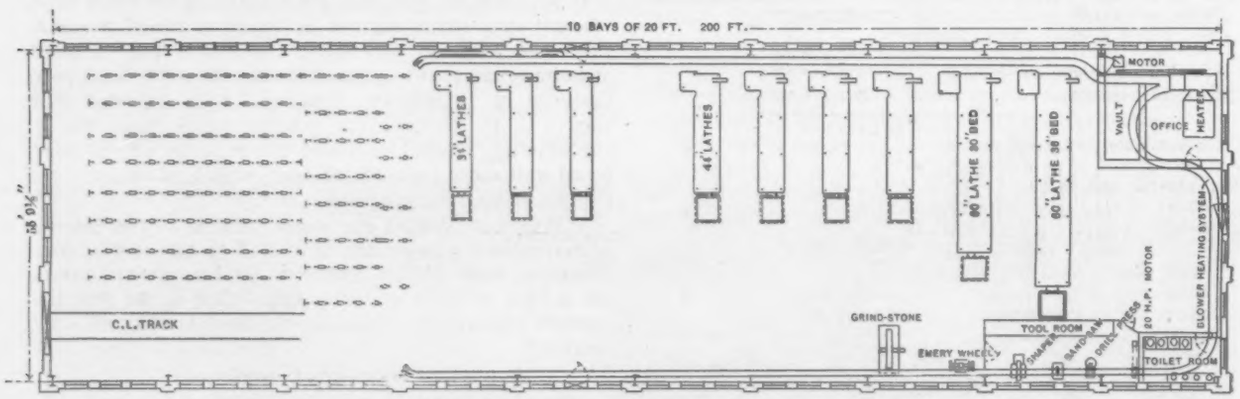


Fig. 26.—Ground Plan of the Roll Shop.

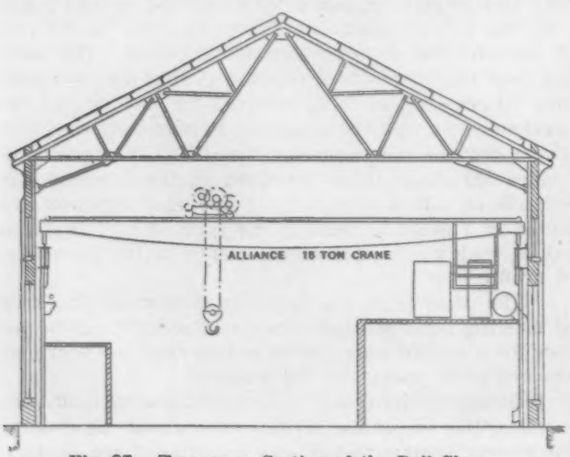


Fig. 27.—Transverse Section of the Roll Shop.

The Smokeless Combustion of Coal.

A bulletin on the smokeless combustion of coal in boiler plants, with a chapter on central heating plants, will soon be issued by the United States Geological Survey, Technologic Branch, giving in detail a study of the conditions found in industrial establishments in 13 of the largest cities of Indiana, Illinois, Kentucky, Maryland, Michigan, Missouri, New York, Ohio and Pennsylvania, between 400 and 500 plants having been inspected. Sufficient information was collected to make the data from 284 plants of value for this report.

The bulletin, prepared by D. T. Randall and H. W. Weeks, not only shows that bituminous coals high in volatile matter can be burned without smoke, but also that large plants carrying loads that fluctuate widely, where boilers over banked fires must be put into service quickly and fires forced to the capacity of their units, can be operated without producing smoke that is objectionable. Proper equipment, efficient labor and intelligent supervision are the necessary factors.

The Interstate Railway Company, a Missouri corporation organized for the purpose of building an electric interurban road between Kansas City and St. Joseph, has taken active steps to perfect its right of way, and is preparing to begin construction. The company reports that it is to build a standard gauge, modern electric railroad on a seven-tenths of 1 per cent. grade and with no curve sharper than 3 degrees.

The Chandler & Taylor Company, Indianapolis, Ind., manufacturer of engines, boilers and saw mill machinery, has taken out permits for a machine shop and carriage shop to cover an acre. They will be mainly of steel and glass; the larger building, the machine shop, having a saw tooth roof. Two other buildings, for offices and storage room for plans, will be erected within a short time.

The General Electric Company's Report.

The General Electric Company has issued its seventeenth annual report, which covers the operations of the fiscal year ending January 31, 1909. The following income showing is made in comparison with the preceding year:

	1909.	1908.
Total receipts	$47,168,469	$72,484,988
Expenses, interest, &c.	42,366,217	65,898,335
Net	$4,802,252	$6,586,653
Dividends	5,214,026	5,183,614
Deficit	$411,774	*$1,403,039
Previous surplus	16,513,836	15,110,797
Total surplus	$16,162,062	$16,513,836

* Surplus.

For the past six years the sales billed have been as follows:

	Sales billed.		Sales billed.
1904	$41,699,617	1907	[illegible]
1905	39,231,328	1908	70,977,168
1906	43,146,902	1909	44,540,676

Unfilled orders as of January 31, 1909, were approximately $13,000,000 as compared with $14,500,000 at the close of the previous year.

The balance sheet given below includes the assets and liabilities as of January 31, 1909, of the Edison General Electric, Thomson-Houston Electric and Stanley-G. I. Electric manufacturing companies which (for the convenience of bookkeeping) are consolidated with those of the General Electric Company:

Assets.

Patents, franchises and good-will		$1.00
Cash		22,233,671.29
Stocks and bonds	$21,922,189.21	
Real estate (other than factory plants)	85,124.66	
Notes and accounts receivable	18,873,057.63	
Work in progress	607,276.59	
	$41,487,648.09	
Merchandise inventories:		
At factories	$15,682,255.88	
At general and local offices	2,547,326.08	
Consignments	164,317.44	
	18,393,899.40	59,881,547.49
Factory plants (including all lands, buildings and machinery)	$13,900,000.00	
Copper mining investment	3,174,580.76	17,074,580.76
Total		$99,189,800.54

Liabilities.

5 per cent. debentures of 1892	$41,000.00
3½ debentures of 1902	2,047,000.00
5 per cent. debentures of 1907	12,875,000.00
Accrued interest on debentures	107,633.36
Accounts payable	2,836,834.51
Unclaimed dividends	1,469.86
	$17,908,937.73
Capital stock issued	65,178,800.00
Surplus	16,102,062.81
Total	$99,189,800.54

During the year there was expended in acquiring sundry patents, for licenses under patents, and in patent litigation, $929,109.08. This amount has been charged to profit and loss, leaving the company's patents, franchises and good will standing at a nominal valuation of $1, the same as at January 31, 1908.

The company has no note payable, nor is there any paper outstanding bearing the company's indorsement.

Vice-President J. R. Lovejoy makes an interesting statement regarding the sales of the year, which, although the smallest since 1906, included a number of important contracts. Regarding Curtis steam turbines, he states that "more than 500 central distributing stations and industrial power plants have adopted these turbines as their generating units, and many are replacing old and inefficient types of prime movers with our turbine generators. The Commonwealth Edison Company, Chicago, has in its Fisk street and Quarry street stations 12 Curtis turbines, having a total generating capacity of 200,000 hp. The New York Edison Company has in its Waterside Station 12 Curtis turbines, having a total capacity of 170,000 hp. The central stations of Boston, Philadelphia, Baltimore, Washington, Minneapolis, St. Louis, San Francisco and most of the other important cities are equipped with Curtis turbines and generators of our manufacture."

Manufacturing and Engineering.

Vice-President E. W. Rice, in charge of manufacturing and engineering, states that expenditures aggregating $2,524,295.32 were made for the completion of buildings and extensions previously commenced and additional machinery, patterns, special tools, fixtures, &c. The following table shows approximately the number of employees as of January 31 during the last five years, including the Pittsfield Works (formerly the Stanley-G. I. Company) for the last two years:

	Employees.		Employees.
1905	18,000	1908	20,000
1906	22,500	1909	23,300
1907	28,000		

The total land area of all of the works is about 515 acres.

From that part relating to engineering, the following extracts are taken:

"Experience in the use of the high electric pressures of from 60,000 to 100,000 volts, needed for the economical distribution of electricity over very long distances, has been so satisfactory that higher pressures up to 150,000 volts are being considered in pending propositions. In this connection it is an interesting fact that the sales of transformers of 60,000 volts and over in 1908 were nearly double those in 1907.

"Our engineers have completed the design of a number of turbine generators for operation by low pressure or exhaust steam. The economic value of these machines is based upon the fact that steam turbines are much more efficient than steam engines in the lower range of steam pressures between atmospheric pressure and a good vacuum. Important turbines of this character have been designed up to 5000-kw. capacity. It is expected that they will, by utilizing the exhaust steam from one of the existing engines, increase the capacity of the combined unit more than 40 per cent. with a substantial reduction in coal consumption.

"We have adapted our steam turbine to the driving of centrifugal pumps and have sold to the city of San Francisco eight 750-hp. and four 600-hp. turbine pumps for a high pressure water system. This is the first important application of steam turbines to this class of service."

The President's Comments.

President C. A. Coffin says: "The year 1908 was marked by severe and continued depression in the business of the company. During the period very few new enterprises requiring apparatus for the generation and distribution of electricity were brought out, and in consequence the business of the company since the last report has largely depended upon current renewals and supplies, with occasional additions to plant on the part of the older and more prosperous companies. The result has been that the orders received during the year were only 70 per cent. of those received for each of the two previous years, and the shipments to customers were only 63 per cent. of the shipments for 1907. This great and sudden shrinkage in the business of the company has, because of difficulty in ratably reducing expenses, resulted in a great increase in the ratio of cost to selling prices, with a corresponding decrease in the percentage of profit.

"The capacity of the factories is now far in excess of existing demands upon them and is sufficient to provide for a considerably greater output than has ever been reached in the history of the company.

"Business conditions are slowly improving, and, with a resumption of normal activity throughout the country, the present unemployed factory facilities of the company and its large accumulation of cash will, it is hoped, be profitably used."

The Cleveland office of the Allis-Chalmers Company has been moved from the New England Building to more commodious quarters at 1411 Schofield Building.

The Latest Ingersoll Combined Knee Type Millers.

Since the description in *The Iron Age*, June 4, 1908, of the first of the knee type combined vertical and horizontal milling machines built by the Ingersoll Milling Machine Company, Rockford, Ill., several important changes have been made in the design. Those apparent on the exterior of the machine will readily be noticed by comparing the illustrations of the Nos. 3 and 5 sizes, illustrated herewith, with that shown in the earlier issue of *The Iron Age*. Principal among these are a more compact arrangement of the parts, some additional levers which have to do with the control, a substitution of hand wheels for the crank handles used in manipulating the table, and the doing away with the chain drive for the feeding mechanism, this being driven now by a vertical shaft and bevel gears on the interior of the column, as shown in Fig. 4. Most of the changes are to be seen in the interior of the machine, which is exposed in the latter illustration. Whereas Figs. 1, 2 and 3 show the machine as driven by a single belt pulley, Fig. 4 shows a motor mounted on the top of the column and connected through gears with a gear on the driving shaft which replaces the belt pulley.

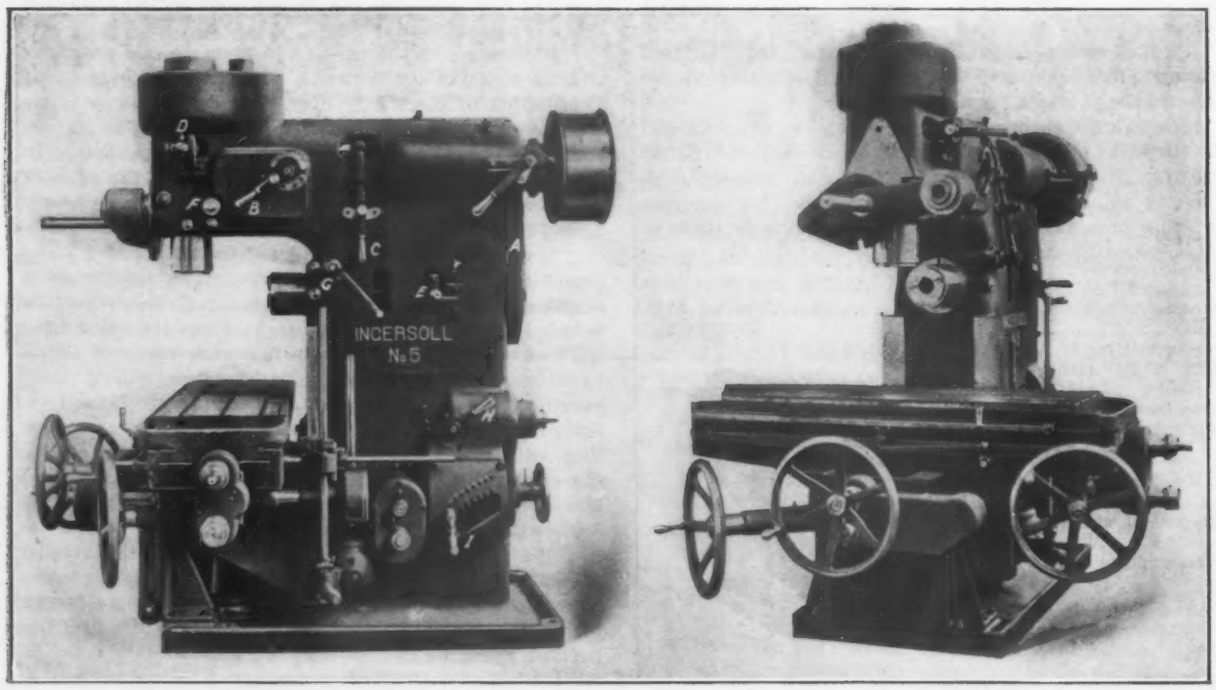


Fig. 1. Fig. 2.

Two Views of the No. 5 Combined Vertical and Horizontal Miller Built by the Ingersoll Milling Machine Company, Rockford, Ill.

Without stopping the motor, the drive of the machine may be disengaged by manipulating the friction clutch *a*, Fig. 4. The main driving shaft, which was formerly above, is now placed to one side and a little below the first intermediate shaft. The handle controlling the driving clutch is shown at A, Fig. 1. The gears *b*, *c*, *d* and *e*, Fig. 4, keyed on the main driving shaft, are in constant mesh with their mating gears on the shaft *f*, which are loose on this shaft except when they are individually engaged by projecting lugs on the shaft *f* when the latter is shifted longitudinally through the lever B, Fig. 1, operating a pinion engaging rack teeth on the end of the shaft *f*. Through the mechanism so far described four of the 16 speeds of the vertical and horizontal spindles are obtained. By manipulating the lever C, Fig. 1, either of the gears *g* or *h*, Fig. 4, may be engaged with the corresponding gears on the shaft *i*, doubling the speed range. From the shaft *i* through bevel gears the shaft *j* transmits power to the vertical spindle through either of the spur gears it carries, and which may be shifted through the lever D, Fig. 1, to alternately engage the corresponding gears on the vertical spindle quill, whereby another doubling of the speed range is obtained, giving the 16 total possible speeds of the vertical spindle. Similarly the horizontal spindle is driven from a pinion on the shaft *i*, Fig. 4, through an intermediate spur gear on the shaft *k* to two gears on the horizontal spindle quill, which may be selectively engaged by the lateral movement of a clutch sleeve controlled by the lever E, Fig. 1. Each spindle quill has an axial adjustment of 6 in. through the crank holds shown at F and G in Fig. 1, which operate pinions engaging racks on the spindle quills.

The feed mechanism is driven from the main driving shaft through bevel gears and the vertical shaft *l*, Fig. 4. By the new arrangement of the feed box it has been possible to bring it in more on the side of the column, with less overhang at the rear than in the old design. The bevel gear on the shaft *m*, like the sprocket formerly used to drive the feed box, is yieldingly secured on its shaft by friction cones under a regulatable spring tension and provides a safety point in the feed train guarding

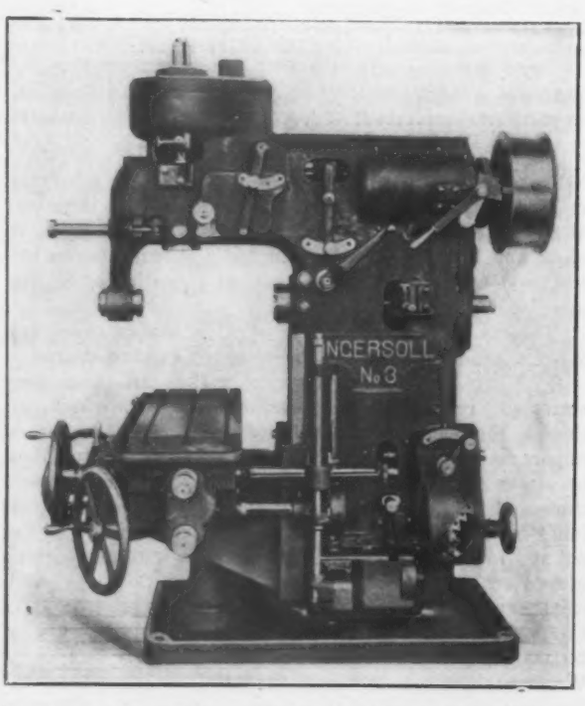


Fig. 3.—The No. 3 Ingersoll Combined Knee Type Miller.

against carelessness in the operation of the tool or an attempt to take too great a feed; it also affords means for reducing the shock when gear changes are made. From this shaft *m*, through jaw clutches controlled by the lever H, Fig. 1, the drive may be transmitted in two different ratios to a cone of gears on the shaft *n*, Fig. 4, and from that shaft by a tumbler gear manipulated through the latch handle I, Fig. 1, to the shaft *o*, Fig. 4. From the latter power is transmitted through bevel and spur gears to the vertical shaft *p*, and in either direction according to which of a pair of facing bevel gears is engaged with the bevel pinion on the lower end of the shaft *p*. The shifting of these bevel gears is effected through a rack by a pinion on the lower end of the rod *q*. The adjustable stops for producing the partial rotation of this rod are plainly shown in Figs. 1, 3 and 4. Through the peculiar cam shape of the adustable stops they are effective in partially rotating the vertical rod *q*, either by axial movement of the rod *r* or its partial rotation as controlled by the lever on the front of the table shown in Fig. 2. Similarly the vertical movement of the table can be reversed by the contact with adjustable stops on the vertical rod *q*. From the shaft *p* the horizontal shaft

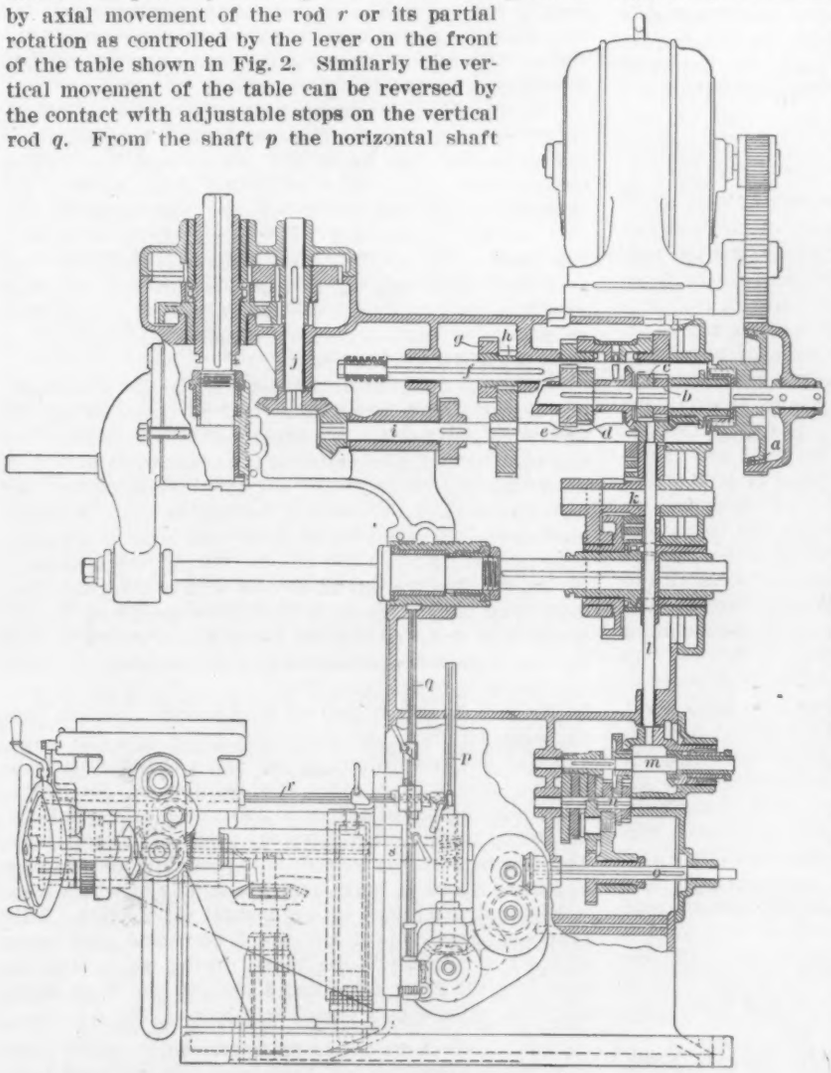


Fig. 4.—Sectional Elevation of the No. 5 Ingersoll Combined Knee Type Miller.

s is driven through worm and worm wheel, and from this point on the drive of the various feeds is essentially as in the older model.

From the foregoing description of the operation it will be apparent that the spindles each have 16 speeds independent of the table feeds. These in both the No. 3 and No. 5 sizes vary from 15 to 350 rev. per min. In the No. 3 machine the knee is not counterbalanced, but it is in the No. 5. The table of the No. 3 machine is 16¼ x 58 in. over all, and of the No. 5 machine 22¼ x 72 in.; the working surfaces are respectively 14 x 48 in. and 20 x 60 in. The feeds are as follows: For the No. 3—longitudinal, 39 in.; cross, 11 in., and vertical, 15 in.; the number of changes, 16; feeds per minute, ½ to 20 in. On the No. 5 machine—longitudinal, 59 in.; cross, 15 in.; vertical, 16 in.: number of changes, 32, and feeds per minute, ⅝ to 24 in. The spindles are hammered open hearth crucible steel and run in phosphor bronze bearings. That in the No. 3 machine is 3½ in. in diameter in the largest taper and in the No. 5 machine 4½ in. in diameter. The taper holes are, respectively, for No. 12 B. & S. and No. 16 B. & S. All of the spindle gears are steel. The larger one for the No. 3 machine is 12-in. pitch diameter, 2-in. face, and of the No. 5 machine 14½ in. in diameter, 2½-in. face. The back gear ratio of both machines is 28 to 1. The driving gears also are of steel. Where a belt drive is provided the No. 3 machine has a 16-in. diameter pulley for a 5-in. belt intended to run at 375 rev. per min. The same speed is intended for the No. 5 machine on its 18-in. diameter pulley for 7½-in. belt. A 10-hp. constant speed motor will drive the smaller machine and an 18-hp. the larger one. The greatest distance between the vertical spindle and the table is 23 in. on the No. 3 machine and 26 in. on the No. 5; the minimum distances are respectively 2 in. and 4 in. On both machines the table may be elevated to a line with the center of the horizontal spindle. The greatest distances from it are respectively 15 and 16 in. in the two sizes. In the smaller machine the distance from the center of the vertical spindle to the face of the column is 16 in. and in the larger 20 in. Both machines are furnished with outboard support for horizontal arbors which are arranged with a convenient means for quickly attaching by swinging bolts, as shown in Fig. 3, and when it is not necessary to remove the support entirely it may be swung out of the way, as shown in Figs. 1 and 2. The No. 5 machine has supporting braces for the outer end of the knee, as shown. This is not necessary in the No. 3 machine and is not provided. The latter at right angles to the spindle occupies a floor space of 100 in. and parallel to the horizontal spindle 78 in. The corresponding dimensions for the No. 5 machine are 144 in. and 96 in. The weights of the two machines are respectively 7500 and 15,400 lb. With either size machine a circular table with an automatic feed can be furnished when required. The regular equipment includes a vise for attaching to the table and the necessary wrenches. No countershaft is required.

British Foreign Trade in Iron and Steel.—Iron and steel exports from Great Britain in the first three months of 1909 amounted to 970,900 gross tons, as against 1,017,190 tons in the first quarter of 1908. The exports of galvanized sheets are conspicuous for showing an increase, being 119,712 tons this year up to March 31, while in the first quarter of 1908 they were 94,574 tons. The rail exports showed even a more marked increase, being 146,677 tons for the first quarter of 1909, or 60,000 tons more than in the same period for 1908. The greatest gain was in shipments to Argentina and to British India. The total of imports of iron and steel was 281,069 tons for the first quarter of 1909, against 252,269 tons to March 31, 1908. The imports of steel blooms, billets and slabs were 103,649 tons and of sheet and tin plate bars 34,035 tons in the first quarter of 1909, against 93,005 and 12,398 tons, respectively, in the first quarter of 1908.

The Atlas Car & Mfg. Company, Cleveland, has recently received orders for several electric cars and locomotives for coke ovens. This company has just shipped to Panama 65 buckets for handling concrete in work on the canal.

The Rockefeller Iron Mines.

A Reminiscence of the Early Years of the Mesaba Range.

An interesting chapter in John D. Rockefeller's memoirs is that in the *World's Work* for April, telling the story of the Rockefeller acquisition of the Mesaba range iron mines and the railroad leading to the Duluth docks; also of the entrance of the same interests into lake transportation. Naturally from the present point of view the events of that troubled time in the Lake Superior ore trade appear in vastly different perspective. Those who mined and sold ore and operated lake vessels in the half dozen years preceding the formation of the United States Steel Corporation can now read Mr. Rockefeller's euphemisms with far more equanimity than they were ever able to command under the stress of his competition. In particular Mr. Rockefeller's account of the letting of the first contract for the Bessemer Steamship Company fleet has more humor in it at this distance than the version originally current on the lakes. We give below some extracts from the *World's Work* narrative:

The Ruinous Effect of the Panic of 1893.

Going into the iron ore fields was one of those experiences in which one finds one's self rather against the will, for it was not a deliberate plan of mine to extend my cares and responsibilities. My connection with iron ores came about through some unfortunate investments in the Northwest country. Among these investments were some shares in a number of ore mines and an interest in the stocks and bonds of a railroad being built to carry the ore from the mines to lake ports. We had great faith in these mines, but to work them the railroad was necessary. It had been begun, but in the panic of 1893 it and all other developments were nearly ruined. Although we were minority holders of the stock it seemed to be "up to us" to keep the enterprise alive through the harrowing panic days. I had to loan my personal securities to raise money, and finally we were compelled to supply a great deal of actual cash, and to get it we were obliged to go into the then greatly upset money market and buy currency at a high premium to ship West by express to pay the laborers on the railroad and to keep them alive. When the fright of the panic period subsided, and matters became a little more settled, we began to realize our situation. We had invested many millions, and no one wanted to go in with us to buy stock. On the contrary, everybody else seemed to want to sell. The stock was offered to us in alarming quantities—substantially all of the capital stock of the companies came without any solicitation on our part—quite the contrary—and we paid for it in cash. We now found ourselves in control of a great amount of ore lands, from some of which the ore could be removed by a steam shovel for a few cents a ton, but we still faced a most imperfect and inadequate method of transporting the ore to market.

When we realized that events were shaping themselves so that to protect our investments we should be obliged to go into the business of selling in a large way we felt that we must not stop short of doing the work as effectively as possible; and having already put in so much money we bought all the ore land that we thought was good that was offered to us. The railroad and the ships were only a means to an end. The ore lands were the crux of the whole matter, and we believed that we could never have too many good mines. Having launched ourselves into the venture we decided to supply ore to every one who needed it, by mining and transporting with the newest and most effective facilities, and our profits we invested in more ore lands. . . .

Frederick T. Gates became the president of the various companies which owned the mines and the railroad to the lake to transport the ores, and he started to learn and develop the business of ore mining and transportation. He not only proved to be an apt scholar, but he really mastered the various complexities of the business. He did all the work, and only consulted me when he wished to; yet I remember several interesting experiences connected with the working out of these problems.

Control of Vessels Decided Upon.

After this railroad problem was solved it was apparent that we needed our own ships to transport the ore down the lakes. We knew absolutely nothing of building ships for ore transportation, and so, following out our custom, we went to the man who, in our judgment, had the widest knowledge of the subject. He was already well known to us, but was in the ore transportation business on a large scale on his own account, and, of course, the moment we began to ship ore we realized that we would become competitors. Mr. Gates got into communication with this expert and came with him one evening to my house in New York just before dinner. He said he could stay only a few minutes, but I told him that I thought we could finish up our affairs in ten minutes and we did. This is the only time I remember seeing personally any one on the business of the ore company. All the conferences, as I said before, were carried on by Mr. Gates, who seemed to enjoy the work, and he has had abundant privileges in that direction.

We explained to this gentleman that we were proposing to transport our ore from these Lake Superior lands ourselves, and that we should like to have him assume charge of the construction of several ships, to be of the largest and most approved type, for our chance of success lay in having boats which could be operated with the greatest efficiency. At that time the largest ships carried about 5000 tons, but in 1900 when we sold out [The year was 1901.—EDITOR.] we had ships that carried 7000 or 8000 tons, and now there are some that transport as much as 10,000 tons and more.

This expert naturally replied that, as he was in the ore carrying trade himself, he had no desire to encourage us to go into it. We explained to him that as we had made this large investment it seemed to us to be necessary for the protection of our interests to control our own lake carriers, so we had decided to mine, ship and market the ore; that we came to him because he could plan and superintend the construction of the best ships for us, and that we wanted to deal with him for that reason; that notwithstanding that he represented one of the largest firms among our competitors we knew that he was honest and straightforward, and that we were most anxious to deal with him.

He still demurred, but we tried to convince him that we were not to be deterred from going into the trade, and that we were willing to pay him a satisfactory commission for looking after the building of the ships. Somebody, we explained, was going to do the work for us, and he might as well have the profit as the next man. This argument finally seemed to impress him and we then and there closed an agreement, the details of which were worked out afterward to our mutual satisfaction. This gentleman was Samuel Mather of Cleveland. He spent only a few minutes in the house, during which time we gave him the order for about $3,000,000 worth of ships, and this was the only time I saw him.

A Familiar Story Retold.

At that time there were some nine or ten shipbuilding companies located at various points on the Great Lakes. All were independent of each other and there was sharp competition between them. Times were pretty hard with them; their business had not yet recovered from the panic of 1893; they were not able to keep their works in full operation; it was in the fall of the year and many of their employees were facing a hard winter. We took this into account in considering how many ships we should build, and we made up our minds that we would build all the ships that could be built and give employment to the idle men on the Great Lakes. Accordingly we instructed Mr. Mather to write to each firm of shipbuilders and ascertain how many ships they could build and put in readiness for operation at the opening of navigation the next spring. He found that some companies could build one, some could build two and that the total number would be 12. Accordingly we asked him to have constructed 12 ships, all of steel, all of the largest capacity then understood to be practicable on the Great Lakes. Some of them were to be steamships and some consorts, for towing, but all were to be built on substantially the

same general pattern, which was to represent the best ideals then prevalent for ore carrying ships.

In giving such an order he was exposed, of course, to the risk of paying very high prices. This would have been certain if Mr. Mather had announced in advance that he was prepared to build 12 ships and asked bids on them. Just how he managed it I was not told until long after, and though it is now an old story of the lakes I repeat it, as it may be new to many. Mr. Mather kept the secret of the number of ships he wished to construct absolutely to himself. He sent his plans and specifications, each substantially a duplicate of the others, to each of the firms, and asked each firm to bid on one or two ships as the case might be. All naturally supposed that at most only two ships were to be built and each was extremely eager to get the work, or at least one of the two vessels.

On the day before the contracts were to be let all the bidders were in Cleveland on the invitation of Mr. Mather. One by one they were taken into his private office for special conference covering all the details preparatory to the final bid. At the appointed hour the bids were in. Deep was the interest on the part of all the gentleman as to who would be the lucky one to draw the prize. Mr. Mather's manner had convinced each that somehow he himself must be the favored bidder, yet when he came to meet his competitors in the hotel lobby the beams of satisfaction which plainly emanated from their faces also compelled many heart searchings.

At last the crucial hour came, and at about the same moment each gentleman received a little note from Mr. Mather conveying to him the tidings that to him had been awarded a contract sufficient to supply his works to their utmost capacity. They all rushed with a common impulse to the hotel lobby where they had been accustomed to meet, each bent on displaying his note and commiserating his unsuccessful rivals, only to discover that each had a contract for all he could do, and that each had been actually bidding against nobody but himself. Great was the hilarity which covered their chagrin when they met and compared notes and looked into each others' faces. However, all were happy and satisfied.

Organizing the Rockefeller Fleet.

With these ships ordered we were fairly at the beginning of the ore enterprise. But we realized that we had to make some arrangement to operate the ships, and we again turned to our competitor, Mr. Mather, in the hope that he would add this to his cares. Unfortunately, because of his obligations to others, he felt that this was impractical. I asked Mr. Gates one day soon after this:

"How are we to get some one to run these big ships we have ordered? Do you know of any experienced firm?" "No," said Mr. Gates, "I do not know of any firm to suggest at the moment, but why not run them ourselves?" "You don't know anything about ships, do you?" "No," he admitted, "but I have in mind a man who I believe could do it, although when I tell you about him I fear you will think that his qualifications are not the best. However, he has the essentials. He lives up the State, and never was on a ship in his life. He probably wouldn't know the bow from the stern, or a sea anchor from an umbrella, but he has good sense, he is honest, enterprising, keen and thrifty."

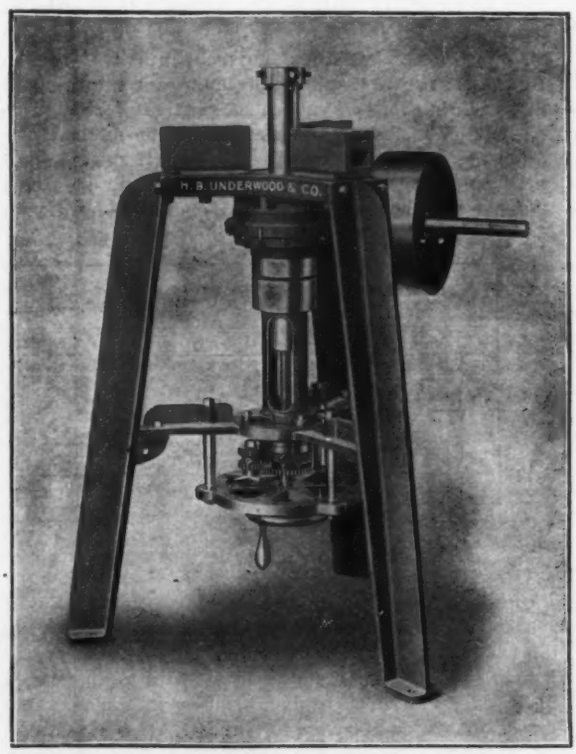
"All right," I said, "let's give him the job," and we did. That man was L. M. Bowers; he came from Broome County, New York. Mr. Bowers went from point to point on the lakes where the boats were building and studied them minutely. He was quickly able to make valuable suggestions about their construction, which were approved and adopted by the designers. When the vessels were finished he took charge of them from the moment they floated, and he managed these and the dozens which followed with a skill and ability that commanded the admiration of all the sailors on the lakes. He is now the vigorous and efficient vice-president of the Colorado Fuel & Iron Company.

The great ships and the railroad put us in possession of the most favorable facilities. From the first the organization was successful. We built up a huge trade, mining and carrying ore to Cleveland and other lake ports. We kept on building and developing until finally the fleet grew until it included 56 large steel vessels.

The Underwood Automobile Cylinder Reboring Machine.

Being frequently called on to rebore automobile cylinders, and finding it difficult to do it economically and efficiently on any of their standard tools, H. B. Underwood & Co., Philadelphia, Pa., designed the machine illustrated. It operates in a vertical position, occupies but little space and requires not more than 1 hp. for its drive, which may be from an electric motor. The drive shaft meshes with a worm wheel, which revolves the cutting spindle; the latter has about 15 in. of travel.

The spindle is equipped with an adjustable head which is used to center the cylinder, and is then removed and the cutting tools substituted. The cutterhead



A Portable Machine for Reboring Automobile Cylinders, Made by H. B. Underwood & Co., Philadelphia, Pa.

consists of four tools set out equally by a taper in the center, and is thus adjusted for the depth of the cut required. The feed is automatic, variable and reversible, and is actuated by a star wheel engaging one or more knockers to suit requirements.

The cylinder to be rebored rests upon three adjustable sliding blocks, which are planed true and at right angles to the spindle. Clamps hold the cylinder in place after it has been centered, and as it rests upon the same face that is bolted to the crank case, original alignment is assured. It is immaterial whether the cylinders are cast separately or in pairs or sets; they are rigidly held without distortion. Inasmuch as most automobile cylinders are blind, it is only necessary to measure the length of cut required and note on the spindle below the travel needed; the latter is graduated for this purpose. As the work is done in a vertical position, the chips fall out and do not clog the cutters or in any other way interfere with the work. The machine is easy to operate and accomplishes an excellent piece of work, reboring the hole parallel, round and with original alignment. Usually only one cut is required, and this may be run through in remarkably quick time. This machine is also capable of boring as well as reboring, and several may be used in the space which a large machine tool would occupy, thereby saving space and power.

The Premium System of Paying Workmen.*

BY F. C. BLANCHARD.†

The premium system was undoubtedly first developed and applied to comparatively heavy work, where each job or operation required considerable time and where each operator or mechanic could be handled independently. Little has been published in regard to the application of the premium system principle to the more rapid operations of lighter work of a manufacturing nature. Here are found both independent operators and those working together in teams, gangs or jobs. It is the object of this paper to describe premium system methods which have been used in connection with this lighter work in the cases of both individual and gang operations.

Individual Workmen.

Where independent operators run screw machines, turret lathes or drill presses on repetition work (disregarding, for the time, matters of a general nature which should be carefully considered before attempting to change work from a straight daytime basis to a premium basis or any other system of payment, and will be discussed later), the first and most important requirement is to set a fair price on each operation. Before a price is determined, it should be known that the method, the machine, the tools and the material are all suitable and in good working order. The operator should be timed on at least three repetitions of the operation by a man who knows that the operator is showing reasonable skill and diligence. The timing should be done preferably by a stop watch and without the knowledge of the operator, by a man located some distance away with a stop watch in his pocket and not keeping his eye on the operator every second. It is not wise to stand right over the man doing the work and flash the watch in his face. He may become nervous and lose time, or may be inclined to slow down when he divines the purpose of the timing, or may try to create an impression on the observer and speed up abnormally. None of these conditions form as good a basis for price setting as the calm, steady swing of regular operation without interference or pressure.

THE BLANK MFG. NAME OF PIECE 3/4" Siphon Bulb. DRAWING NO. X-1323 PREMIUM OPERATION DATA SHEET

OPERATION NO.	OPERATION DESCRIPTION	TIME (IN SECONDS) OBSERVED			AVGE.	PIECES PER DAY THEOR.	DISC.	ACT'L	DAY RATE	MINIMUM PCES.	MINIMUM RATE	EXCS. PER 100	OBSV. BY	FIG'D BY	O.K. BY	DATE
81	Threading Top End	32	30	28	30	1200	25	900	1.75	500	1.25	.125	CHS	WRT	FCB	3/27/9
82	Threading Bott. & Forming	85	84	87	85	424	15	360	2.00	200	1.43	.36	"	"	FCB	4/6/9

Fig. 1.—Form for Recording Data Fixing the Premium for Individual Operations.

The timings being made give the basis for setting the price. A form somewhat like Fig. 1 is used where operation numbers are assigned; the operations are defined and described and the observed times entered. The average of these times is calculated and from this the theoretical pieces per day, which, however, a man cannot be expected to produce in a day's time. His tools must be ground and reset, and his machine oiled and cleaned; a belt will break occasionally and other legitimate delays must be recognized and provided for by determining the proper discount to apply to theoretical pieces per day. In the writer's experience on light work the theoretical pieces per day must be discounted, generally from 10 to 30 per cent.

The next item is the rate per day. This represents what each job is considered to be worth on a day work basis, and should be considered entirely independent from the day rate of any operator that may happen to have done such work before the premium rates were established. Certain operations should be rated as worth so much per day on a day work basis; it then generally becomes known that they have certain rates, and any operator capable of performing them should be designated for such work independently of the day work basis that may be placed on each operation. This is a decidedly impersonal basis and encourages operators on lower grades of work to so perfect themselves that they may undertake work rated on a higher day work basis. Conversely it provides an argument to any complaint from an operator with a higher day rate when placed on a job that is rated at less per day. He can be told that his day rate is higher, and that presumably he is a more competent man and can undoubtedly perform enough more of the work to bring his earnings into line with his day rating.

The rate per day being established on a basis fixed by the nature of the work and the skill required for its performance, the next step is to determine the minimum pieces per day and the minimum rate per day. These are rather arbitrary elements and are simply established to enable placing such a rate on the excess over the minimum that the employer will share to a certain extent with the operator in production exceeding the production required to equal the day rate. The writer has arbitrarily set the minimum pieces at five-ninths of the pieces per day and the minimum rate at five-sevenths of the rate per day. This leaves four-ninths of the pieces per day to be done at two-sevenths of the rate per day, and a little figuring will show that the excess pieces are paid for at just one-half the price per piece as the minimum pieces. In other words, the employer and the operator share alike in the fruits of excess production. This is the well recognized feature of the premium system, although different conceptions of the system and different conditions tend to greatly vary the division of the excess between the employer and employee. It cannot be claimed that there is any particular science in the method of figuring the rates after the pieces per day and the rate per day have been established, but the method is simple and has worked out satisfactorily.

Gang Operations.

The second case, where operators work together in a team, gang or job, requires different treatment, because any particular effort on the part of an individual will not result in greater production, since a piece passes from hand to hand and the total production depends almost wholly on the slowest man. Generally one man has been constituted the head or leader in a gang and prices have been arranged with him for producing work. He thereby pocketed all the profits or stood all the losses, according to his ability to drive his team. This is the common form of contract system considerably used in the past, but not favored by modern manufacturers for a number of reasons. This leader is vitally interested in the day rates of his operators and is likely to dictate them, whereas it is much better that they be set by the management. Further, the leader much be continually driving and pushing the men under him, taking much away from his own ability to perform work, and creating friction and bad feeling in a great many ways.

For the last four or five years the writer has used a system whereby every member of the gang shares in the profits obtained from excess production. Considerable opposition was raised to its introduction at first by the leaders, who naturally figured that the premium paid to

* From a paper presented before the National Metal Trades Association, April 15, 1909.

† Treasurer and works manager of the Ashcroft Mfg. Company, Bridgeport, Conn.

the operators in their teams would reduce their profits. Experience has shown, however, that this is not the case, since any system which obtains and holds the interest and co-operation of every one involved will so greatly increase the production that enough extra profits are made so that every member of the team receives some extra money and the leader as much as before. The leader sets the pace and his operators follow. He does not need to get behind and prod, nor does the management need to point out laggards. Most of the gang will want to make some extra money, and if one or two hold back they will be so treated by the others that they will either speed up to the pace set or will be crowded out and replaced by more willing workers. The writer has found this condition of things to obtain automatically within the team itself and not require much supervision by the general management of the factory.

This system can hardly be called a "premium system" in the strictest sense of the term. Fig. 2 shows a form which may be used in figuring work on this basis. Generally speaking, a straight piece work price is set for each job and the value of the work produced by the team is thus figured. Taking the case shown in Fig. 2, work to the total value of $47.50 was produced during week ending March 27. Each of the four operators has his own day rate, depending upon his ability and the nature of the work which he performs. This multiplied by the hours he worked during the week gives the amount due him on a straight day work basis. Summing

THE BLANK MFG. CO. — PREMIUM JOB SHEET

JOB Gage Spring LEADER J. Brown WEEK ENDING 3/27 1909

WORK DONE						DAY RATE EARNINGS				PREMIUM		TOTAL	
QUANTITY	DESCRIPTION	PRICE	AMOUNT		NAMES OF OPERATIVES	HRS.	RATE	AMOUNT		EARNED		EARNED	
253	#7 Common	.030	7	59	J. Brown	55	30	16	50	3	96	20	46
340	#2 Heavy	.025	8	50	P. Smith	55	25	13	75	3	30	17	05
698	#3 Special	045	31	41	E. Rose	11	25	2	75	0	67	3	42
			47	50	R. Small	53	10	5	30	1	27	6	57
								38	30	9	20	47	50

Fig. 2.—Record for Gang Operations.

these up for each operator gives the total labor cost of the work produced, as shown in the left side of the form. The difference is the excess earnings, or premium, which is divided among the members of the gang in the ratio that each man's earnings on a day rate basis bears to the total day work cost of the work produced. In actual operation the management may set each operator's day rate according to its best judgment, and will naturally place the leader's rate higher than the rate of any other operator, and may increase or decrease the rate of any operator in the gang as his worth may increase or decrease. The premium is divided according to the skill, ability and application of each man in the gang, and while a competent and hustling man as leader gets a much larger proportion of the premium than an unskilled boy who may be assisting, it is an equitable method of distributing the premium, and at the same time gives every one an incentive to do the best team work possible, and, further, to so increase his individual skill and ability that he may merit an increase in his day rate and thereby receive a larger share of the premium.

Establishing a System.

In general it would be a mistake to attempt to change the method of payment throughout a shop or factory instantaneously, and, since all such changes are viewed with more or less suspicion, it is best to start in a small way with those jobs which will make the best showing, or those handled by men most favorable to the introduction of a system that will enable them to earn more money by increased effort. One job started right is the best possible advertising throughout the shop and soon paves the way for starting a second job, and so on, by slow, persistent and careful work, a very large percentage of operators in almost any shop or factory can be gradually changed over to better systems of payment, resulting in reduced costs to the employer and increased earnings by the operator. The writer has seen costs reduced in this manner from 30 to 60 per cent., and in places where it was supposed that the work was going along fairly well on a day work basis.

It is most important to correctly set the prices. If set too low no premium will be made, and the employees will become discouraged and dissatisfied with the system. If set too high, the operators are likely to have a quiet laugh on the management and to take things easy at the expense of high factory costs. A price once set should not be changed unless it is considerably in error. It is, of course, easier to raise a price than it is to lower it after it is once established, therefore it is better to err on the low side than on the high side in setting the price. It is a delicate matter to reduce prices that are too high. The practice in some shops of making a horizontal reduction in all prices at yearly intervals or at any one time is bad and should be avoided. With nearly every man in the shop disgruntled and dissatisfied at the same time, the chances for organized opposition are much greater than if occasionally only a very small percentage of the help are given cause for injured feelings. It is well to investigate any prices that seem to develop as being too high and by making some little change in tool or method effect a reduction of time, and use this as a reason for reducing the price. A little tact and ingenuity can be used to good advantage along these lines.

The writer favors settling with the help every regular pay day. As a rule the employees need the money and feel that the excess earnings belong to them and are not a gift to be bestowed by the management of the factory at its convenience.

The question of allowing department foremen to share in the premiums earned in their departments is sometimes raised. While many managers would like to reward their foremen for efficiency under their jurisdiction, it must be recognized that many foremen thus sharing in premiums would likely be somewhat biased when questions of prices come up for discussion and treatment.

The Merchants Heat & Light Company has purchased the site of the Chandler & Taylor engine works at 740 West Washington street, Indianapolis, Ind., and will erect on it a plant to cost $300,000. The plans for it are being made by J. G. White & Co., New York. The new plant will be adjacent to a canal, but the company will also erect a pumping station at White River, a block away. A 24-in. main will be laid to the business section of the city from the plant. The site for the plant is 250 ft. square. The buildings will be of brick and steel. The power house is to be completed December 1, and will be patterned after the Government power plant at Washington. Extensive improvements are also planned by the same engineers for the company's present plant at New Jersey and Pearl streets, and they are to be completed by September 25. The site of the new plant is one of the landmarks of the city, having been occupied as far back as 1859 by Wiggins & Chandler, which five years later became Chandler & Taylor, manufacturers of engines and boilers.

A Model Warehouse Arrangement.

Problem of Distributing Weight of Heavy Shelf Material as Solved in Eastern Warehouse of the National-Acme Company.

The problem of storing such material as screws, bolts, nuts, &c., in structures, without overloading the floor, is one that is often met with in cities where municipal building departments regulate the amount of load that can be applied to each square foot of floor space. The manner in which the National-Acme Company, Cleveland, Ohio, has stocked its Eastern warehouse at 77 White street, New York, is an example of good management.

The company has the basement and first floor of that building, which is 25 x 100 ft., and on the first floor, where its stock bins are located, carries something over 2,500,000 pieces of screws, brass nuts, finished, semi-finished and milled iron nuts, taper pins, &c. This material is compact and very heavy. The storeroom is 25 x 85 ft., and the problem was to put some 200,000 lb. of stock in bins and arrange the material systematically without loading more than 300 lb. on a square foot. In the basement, where approximately 3,500,000 pieces of reserve stock are kept, together with some heavy automatic screw matchinery for demonstration purposes, no limit was put on the amount of weight the floor could carry, but it was found necessary to do much studying to evolve a plan for arranging the stock on the upper floor to the best advantage. The planning resulted in the construction of a series of movable bins as handy as a sectional bookcase. Of course, 200,000 lb. could, under such circumstances, be easily distributed over 2125 sq. ft. of floor space, but, with aisle room to be reserved and heavy stock to be put in the bins according to their graded sizes, in order to make them easily accessible, quite a problem was presented. L. M. Waite, Eastern manager for the company, set out to solve the difficulty by first devising a series of bins and arranging their positions.

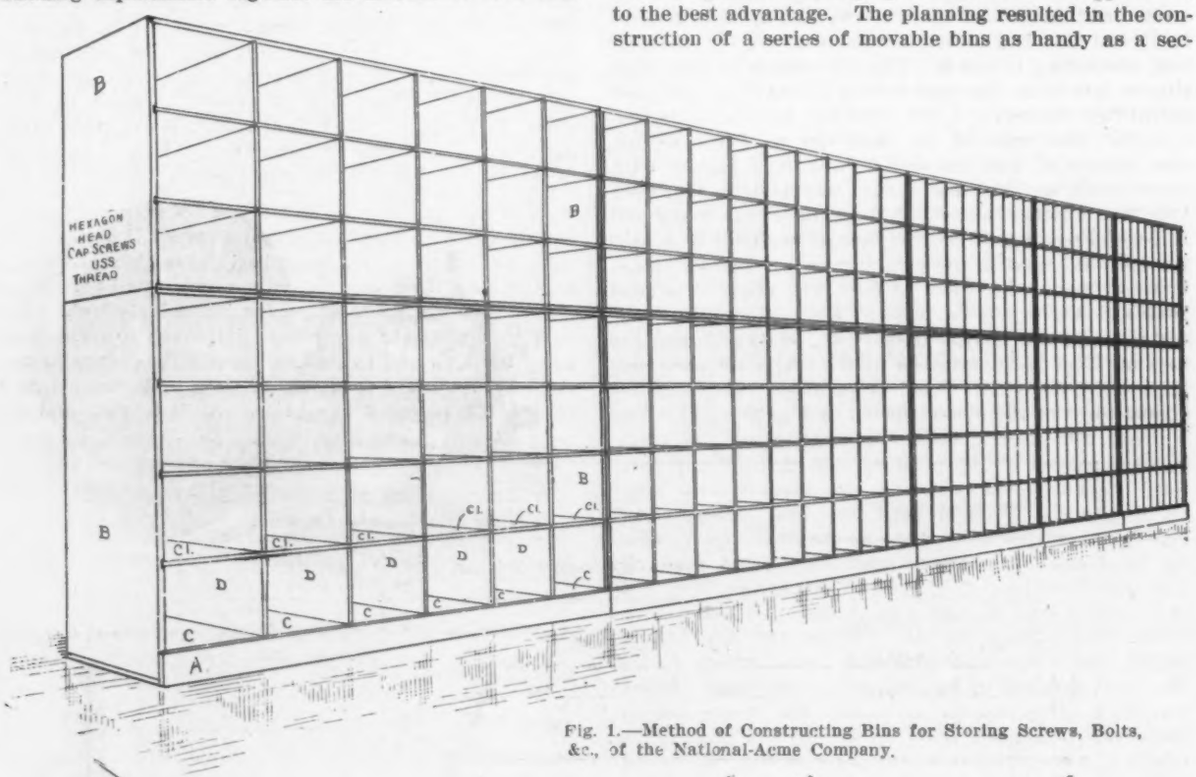


Fig. 1.—Method of Constructing Bins for Storing Screws, Bolts, &c., of the National-Acme Company.

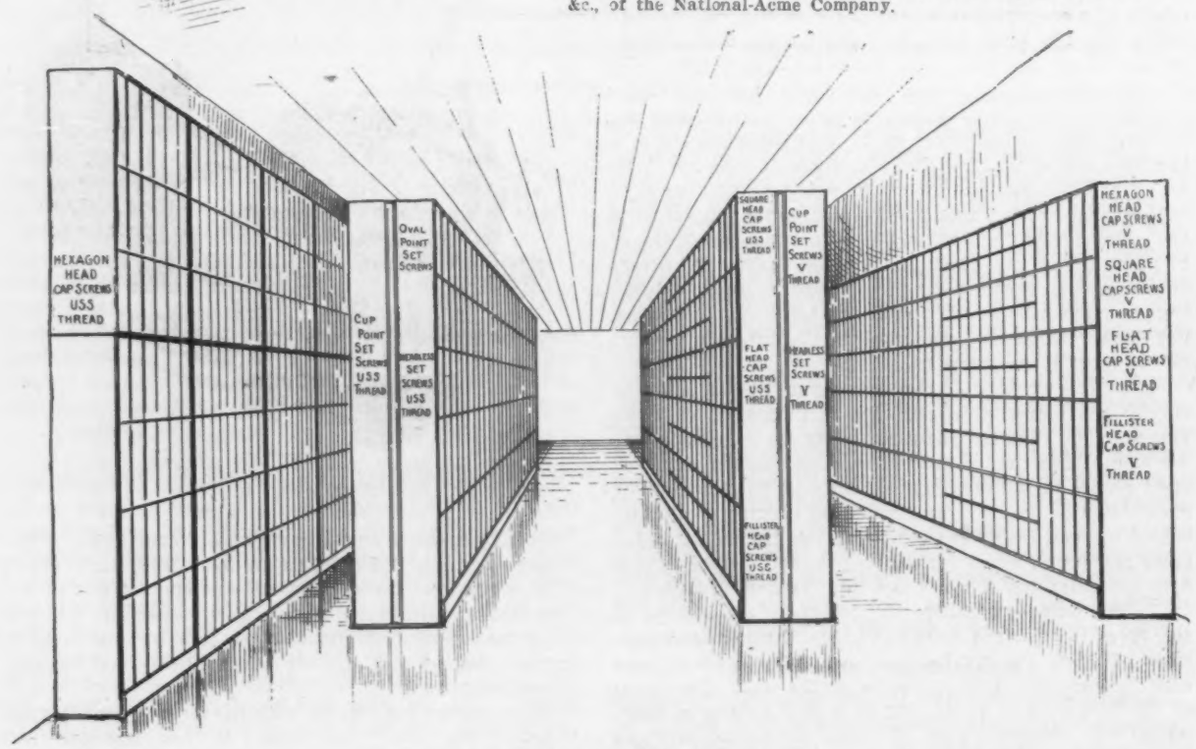


Fig. 2.—The Complete Arrangement of the Bins.

He then obtained the average weight of the different sizes of packages of stock, the carrying weight of each section of bins, and after that it was a mathematical proposition to figure out the distribution and systematically arrange the sequence of sizes to conform to the weight distribution.

The construction of each section can be explained with the aid of the letters on the section in the foreground of Fig. 1. Under the clapboard A there is heavy planking for solidity, with sufficient raise to meet insurance requirements. The end boards B and B were erected and the bottom board C was then fitted in grooves in B and B. The second bottom board C 1 was next laid, connecting B and B. The side boards D were then slipped into place between boards C and C 1, and then nailed fast through C 1 and toenailed into C. This construction was repeated for each tier until the section was completed, and the section was then backed with matched siding. The first section was made in four tiers and then another section of three tiers was made and lifted into position on top of the first section. The lumber material used in the construction of the bins might interest those who wish to duplicate them. The end boards B are of 1⅜ in. finished white pine. Boards C and C 1 and side boards are of ⅞-in. white pine and the backing is of ¼-in. matched siding. The complete sections are 6, 8 or 12 ft. long, as required. The complete arrangement of the bins is shown in Fig. 2.

Next came the question of distributing the stock, which consisted of cup point set Uss threads, cup point set V threads, oval point set Uss threads, oval point set V threads, hexagon head cap Uss, hexagon head cap V, square head cap Uss, square head cap V, fillister head cap Uss, fillister head cap V, flat head cap Uss, flat head cap V, headless set screws, cup and oval points, both V and Uss threads, besides a large stock of hexagon brass nuts, finished and semi-finished milled iron nuts, taper pins and brass battery knurls. The arrangement of the stock in the bins followed according to the figures devised by Mr. Waite and his assistants. Hexagon head cap screws Uss threads, for example, were allotted to the wall section on the left of Fig. 2. The small diameters and lengths were started in the upper left hand bins following along the upper line to the end by proper sequence. Then the small sizes of the next listed diameters were started under the heavier screws of the sizes above, and led along the row until the heaviest of the lower line were under the lightest of the line above. This plan was followed throughout and the weight was evenly distributed by skipping an occasional bin, which was also done where necessary to provide for any possible bin over stock. The exact figures used in working out the plan would be too voluminous to publish here, nor would they be of any real value, but the arrangement of the stock in the different sections can be seen by referring to Fig. 2.

The faces of all the bins are painted black and the size of the material in each bin is indicated by white figures. The diameter figures are on the side face and the length is on the top face. The sections are arranged at right angles to the floor joists. The construction has now stood for a year and a half with the varying strains incident to such heavy material and the alignment to-day is as perfect as when constructed. Each section stands firm and solid and there is absolute freedom from sag.

In the basement, where the reserve stock is kept in the cases in which it is shipped, the various denominations of stock are divided into sections and their class and sizes are indicated by figures on the wall. The front of the basement is given over to a demonstration room, where the different sizes of Acme automatic multiple spindle screw machines are shown, operated by small motors.

Recent car orders reported by the *Railroad Age Gazette* include 200 for the Cuba Railroad, 1500 50-ton steel gondola cars for the Western Pacific, 900 steel underframe cars for the Boston & Maine, 114 passenger cars for the Southern, 300 freight cars for the Norfolk & Western. Locomotive orders include 50 for the Boston & Maine, 20 for the Chesapeake & Ohio, in addition to 15 ordered earlier in the year. The Kansas City, Mexico & Orient is in the market for 20 locomotives.

A. U. S. Electric Internal and External Grinder.

A combination center grinder for internal and external grinding is manufactured by the United States Electrical Tool Company, Cincinnati, Ohio. The internal grinding attachment is driven by a belt from a pulley on the armature shaft to a small pulley on the internal grinding spindle, as shown in Fig. 1. The speed of the internal grinding spindle, using a wheel 1¼ in. diameter by ¼ in. face, is 18,000 rev. per min. The bearings of this attachment are cone bearings, adjustable for wear and dustproof. This type of grinder is made in four sizes. The internal grinding attachments are made ranging to grind to depths of from 4½ to 18 in. The motor is wound for 110 or 220 volts, direct, current, or for

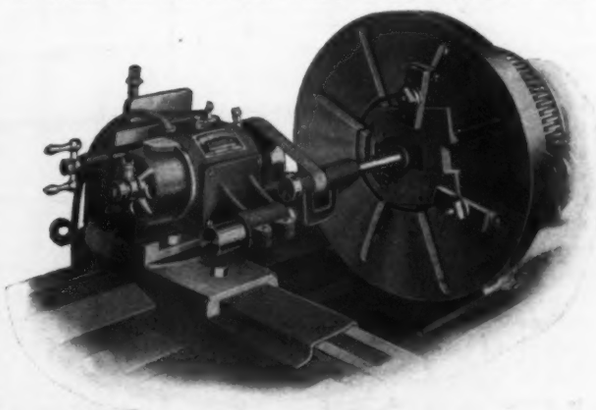


Fig. 1.—Portable U. S. Electric Grinder with Internal Grinding Attachment.

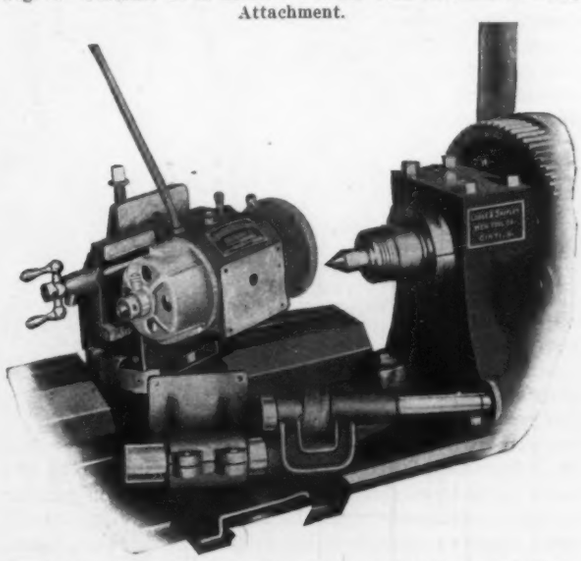


Fig. 2.—The Attachment Removed and Machine Used as a Center Grinder.

110 or 220 volts, 60-cycle, one, two or three phase, alternating current. The grinders are made with angle plates so that they can be bolted on the compound rest of engine lathes. This type of grinder is especially adapted for grinding out dies and also for grinding out gasoline engine cylinders and also for hardened dies and internal grinding of all kinds.

Fig. 2 shows the grinder with the internal grinding attachment removed. The grinder is then used for such work as grinding centers, reamers, cutters, mandrels or dies in a lathe, planer or shaper. The bearings of this grinder are cone bearings, adjustable for wear and dustproof. This grinder is made to carry emery wheels ranging from 4½ to 12 in. in diameter.

The Independent Pneumatic Tool Company, Chicago, has moved its general offices from the First National Bank Building to a new building at 1307 Michigan avenue.

Improved Bosh Construction for Blast Furnaces.

BY J. E. JOHNSON, JR., GLEN WILTON, VA.

There are few subjects on which more thought has been expended by blast furnacemen than the proper construction of the bosh. The type most generally in use is undoubtedly a bosh plate construction with removable bronze plates, as in Fig. 1. The dotted lines show the brick work as originally built, the solid lines the shape to which this brick wears under the combined influence of the melting stock from above and the high velocity of the blast from below. Every furnaceman who has had experience with this type of plates has seen furnaces blown out in a condition at least as bad as this and often far worse. This condition has three serious disadvantages: First and chiefly, it opposes the greatest possible obstacle to the regular and even descent of the stock in the bosh, and furnishes, on the other hand, ideal skewbacks for the support of an arch—that is, a scaffold.

Second, the wearing away of the bricks between the plates diminishes the mechanical strength of the construction to a grave, not to say dangerous, extent.

Third, the great projection of the plates into the furnace without much support below exposes them to the greatest possible danger of bending and cracking and to the greatest danger by the drip of molten metal upon them. This construction is also open to the objection of very high first cost on account of the quantity of bronze required and the quantity of brick required to support the bronze.

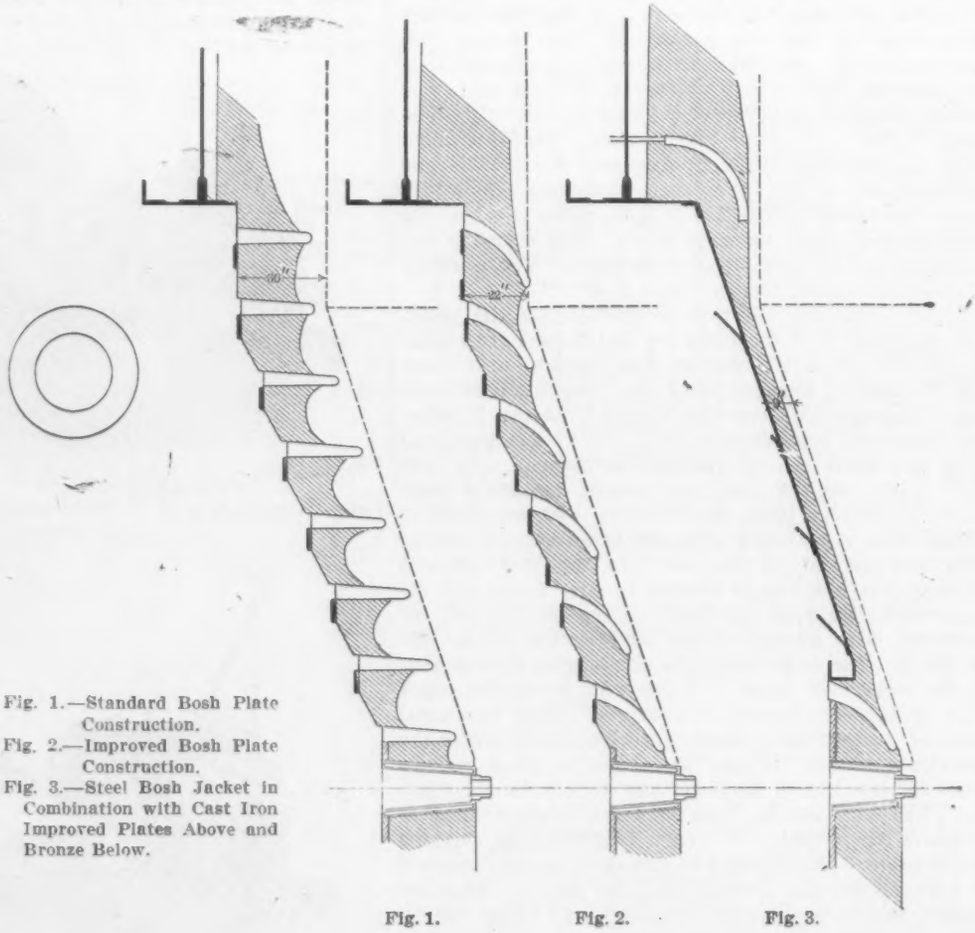


Fig. 1. Fig. 2. Fig. 3.

Fig. 1.—Standard Bosh Plate Construction.
Fig. 2.—Improved Bosh Plate Construction.
Fig. 3.—Steel Bosh Jacket in Combination with Cast Iron Improved Plates Above and Bronze Below.

Fig. 2 shows a construction intended to obviate all of these disadvantages. The cross section of the plates is a wedge whose center is a circular arc. Such a wedge permits itself to be withdrawn exactly the same as a straight one. As a result of this construction the brick on the under side of the plates is so protected that it is impossible for it to wear away to any considerable extent, while the surface presented to the furnace after the nose of the bricks has worn away is not a sharp ledge, but a smooth surface with a slope virtually identical with that of the original bosh wall, as good a surface to facilitate the descent of the materials as could well be imagined.

Owing to the impossibility of erosion at the back of the plates the mechanical strength of the bosh will remain unimpaired and a thinner wall initially will be stronger after wear than a heavy wall is with the ordinary plates. Owing to the fact that the points of the plates of one row approach the backs of the plates of the other row, a much smaller number is required. In the drawing six rows of plates give far better protection than eight rows of flat plates, while the lengths of the plates measured on their axes are practically identical in the two cases.

Objection may be raised that the brick work will be difficult with these plates; but on further consideration it will readily be seen that by having a small number of special shapes and using a plate of standard curvature the brick work can be built with little more trouble than the ordinary type of brick work. The extra expense in this respect will be more than offset by the decreased number of plates required.

Where the steel bosh jacket construction with external cooling troughs is used, one of the most serious difficulties is to protect the top of the bosh where the thin brick of the bosh joins the lining. Another is to protect the tuyeres from the excessive scouring of the bosh wall. A glance at Fig. 3 will show that the improved cooling plates serve admirably for the latter purpose, but for the former cooling plates of the renewable type have the objection that holes must be cut through the jacket in a way that almost cuts it in two in order to allow them to be removed. On the other hand, removable plates are a luxury, not to say an extravagance. An experience of a good many years has shown me that cast iron plates at this hight in the furnace will go through a blast of several years and come out almost unchanged in appearance from what they were when they went in. Therefore, for this purpose I prefer to use cast iron cooling plates, with pipes cast in them curved, as shown in Fig. 3. These are built solidly in the brick work, the pipes passing out through the shell, but no provision being made for the removal of the plates themselves.

With this type of construction it is certain that, however much brick may be put in, it will all wear away down to about 4 or 5 in., and for this reason the furnace should be so designed that the desired lines will be obtained when the brick work has worn away down to this point. For reasons of physical strength in the beginning it does not do to build the brick less than 9 in. thick, but 4 or 5 in. of this should come inside of the line of the bosh, so that when the brick has worn away

to the point at which the external cooling will hold it the furnace will have the correct shape. To build the furnace to her proper lines with 9, 13 or 22 in. of brick on the bosh jacket, with the absolute certainty that all but 4 in. of it will be gone in three months, is only to waste brick to make the furnace a shape which is known in advance to be wrong.

Thus it would seem that with the curved bosh plate we have a choice of either the bosh plate and band or the bosh jacket type of construction with the greatest disadvantages of both removed, and with the virtual certainty of greater life and better furnace work in both cases. Arrangements for the manufacture of these plates are being made.

Sharon's Manufacturing Advantages.

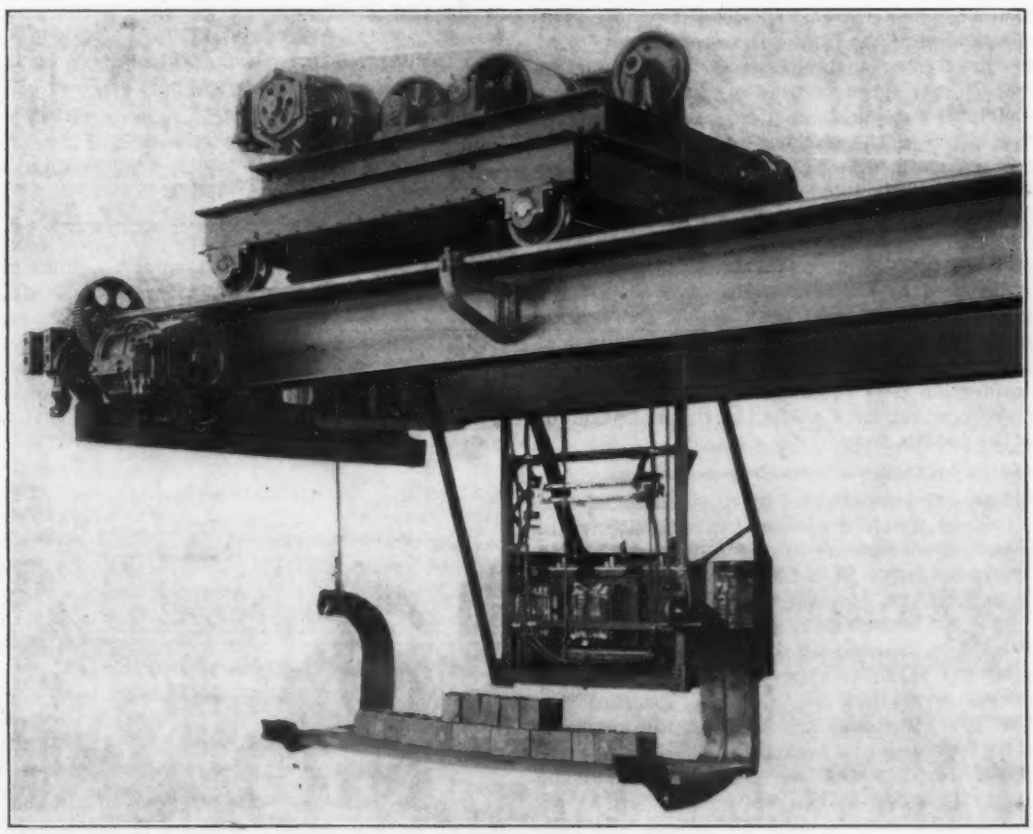
The Sharon Board of Trade, Sharon, Pa., is distributing a folder setting forth the advantages of that city as a manufacturing center. It is situated 70 miles from Pittsburgh, 77 miles from Erie, 81 miles from Cleveland and has five railroads—the Pennsylvania, the Lake Shore & Michigan Southern, the Erie, the Pittsburgh & Lake Erie and the Baltimore & Ohio. Sharon also has direct connection at Sharpsville, Pa., 12 miles north, with the Bessemer & Lake Erie Railroad. A list of the manufacturing plants now located at Sharon is given, these being as follows:

Carnegie Steel Company's North Works and South Sharon Works, Stewart Iron Company, Shenango Iron & Steel Company, Sharon Steel Hoop Company, Petroleum Iron Works Company, National Malleable Castings Company, Shenango Machine Company, Sharon Boiler Works Company, Sharon Foundry Company, Sharon Pattern Works, Sharon Novelty Company, Damascus Brake Beam Company, Sharon Hardware Mfg. Company, Masurite Explosive Company, Driggs-Seabury Ordnance Corporation, Wilkes Rolling Mill, Frick-Turner Gas Engine Company, Carnegie South Sharon Works, American Steel & Wire Company's wire and nail mills, American Sheet & Tin Plate Company's South Sharon and Mercer Works, American Steel Foundries, Sharon Coke Company and Sharon Firebrick Company. There are 12 blast furnaces in and about the city.

A Whiting Electric Scale Crane.

The novel feature of a new type of electric scale crane, built by the Whiting Foundry Equipment Company, Harvey, Ill., is in the application of the scales for weighing material. These are supported on the trolley truck frame and carry the hoisting mechanism on an independent steel framework. The scale beams are in the cage suspended from the trolley, and readings are taken and recorded by the operator. There are three beams—two scale beams with self-recording poises and one tare beam, enabling weights to be determined of several different items of material easily and accurately. By moving a hand lever all load is transferred from the knife edges of the scale to the trolley truck frame, and then the operation is the same as with an ordinary trolley.

Formerly crane weighing was accomplished by hanging a scale on the hook. This required a special man to read, enter and calculate weights and deduct the tare, a process much more laborious than with the new arrangement, which also decreases the liability of personal error. The scale on the hook also occupied considerable head room which was often a disadvantage. An open side platform is furnished, as shown in the illustration, for carrying long pieces, such as rods, bars, &c. The design of this platform is made to suit the material to be handled. Three motors are provided, one each for the hoisting, trolley travel and bridge travel.



A Three-Motor Electric Traveling Scale Crane Built by the Whiting Foundry Equipment Company, Harvey, Ill.

A crane of this type is most useful in loading material, checking invoiced weights and in loading for shipment, for inventory, &c. Six of these cranes of 5 tons capacity each, 37 ft. 10¼ in. span, operated by alternating current, have just been completed for the new warehouse of the Scully Steel & Iron Company, Chicago, Ill.

The bi-monthly meeting of the structural section of the Engineers' Society of Western Pennsylvania was held in the Fulton Building, Pittsburgh, on the evening of May 4. R. B. Woodworth, engineer with the Carnegie Steel Company, presented a paper on the subject of "The Steel Oil Derrick." At the regular meeting of the society to be held May 18, Mr. Woodworth is expected to present a paper on the subject of "Steel Beams."

Efficiencies of Combustion Processes Compared.

BY THEO. J. VOLLKOMMER.*

Although much has been written on furnaces, producers and combustion, giving scientifically accurate calculations of heat balances, to the average furnaceman the meaning of these calculations is not clear, and he cannot reconcile the figures with actual conditions of operation. He is not concerned with how many molecular weights of carbon are contained in his coal pile, or how many molecular volumes of fuel gases pass through his gas flues. His interest is in the furnace which realizes the highest earnings on the investment under the special conditions which the nature and quantity of his products, the price of fuels and the wages of attendants impose upon him.

In the strictly scientific treatises the calculation of efficiency is based, not on the relation of the amount of heat absorbed by the article to be heated to the total heat supplied, but on the ratio of the heat units carried off by the waste gases to the total heat supplied. The shape and condition of the furnace, the radiation of heat through and by the walls, the effects of leaks, the effect of influx of cold air through the doors and other items are not considered at all, although they are likely to have the greatest effect on the economy of production. The following is not claimed to be a scientific deduction or calculation; it is merely intended to be a comparison of the relative efficiency of various modes of combustion. Even in the same heating furnace the efficiency will vary, as during the starting up a comparatively large amount of heat is absorbed by the brick walls, and when these are brought up to the normal heat, a new cool charge will absorb more heat than later when it is near the final temperature. In the beginning a cold charge may even absorb considerable heat radiated back into the hearth from the brick work, thus rendering the radiation of heat from the hearth temporarily negative.

Conditions Assumed for the Comparison.

To avoid complications caused by these changing conditions, in the comparison a furnace has been selected in which the absorption of heat by the body to be heated is nearly uniform—*i. e.*, a muffle furnace, where the muffle is to be kept at a constant temperature. The temperature inside the muffle had to be kept at about 900 to 1000 degrees C., which necessitated a temperature in the space around the muffle of about 1200 degrees C. The maximum amount of heat which can be absorbed theoretically by the muffle and the charge in the muffle is the difference between the heat furnished by the combustion of a unit of fuel and the heat carried off by the waste gases at 1200 degrees C., less the heat lost by radiation of the brick work around the hearth and combustion chamber. The latter varies considerably with different constructions of furnaces and with the temperatures in the hearth. For the purpose of comparison, the construction of the hearth of the furnaces is assumed to be the same in all cases and the heat lost by radiation to be in proportion to the temperatures in the hearth.

Perfect Combustion.

The combustion would be ideal if each atom of carbon would find and combine with two atoms of oxygen, and in case free hydrogen is present in the fuel, if every two atoms of hydrogen would combine with one atom of oxygen. With less oxygen, part of the fuel cannot be burned and escapes either without taking part in the combustion at all in the form of smoke (fine carbon particles) or hydrogen gas, or only gets partly oxidized as carbon monoxide. Even admitting the theoretically correct quantity of air, perfect combustion is nearly impossible and a certain excess of oxygen must be admitted.

Pure oxygen is too expensive to use in most industrial furnaces; air which is approximately one-fifth oxygen and four-fifths nitrogen is free. To maintain combustion with air, it is therefore necessary to admit with each part of oxygen four parts of nitrogen, which is entirely inert. Moreover, it must be heated to the temperature of the flame, and most of the heat furnished by the combustion is absorbed at once by this inert gas, thus reducing the temperature of the flame to about two-thirds of what it would be if only oxygen were admitted for combustion. This presumes the theoretical amount of air to be admitted. Practical considerations mentioned later require a certain excess of air; in the ordinary grate fire it amounts generally to about 100 per cent., thus making the total amount of air double the theoretical quantity. Heating this excess air to the temperature of the flame reduces the temperature to about two-sevenths of the temperature obtainable by the combustion in oxygen. The only but sufficient excuse for this waste of heat is that the cost of the fuel wasted is less than the cost of pure oxygen for the combustion.

Combustion with No Excess Air.

Average Pittsburgh coal contains 75 per cent. carbon, 5.3 per cent. hydrogen and 12.7 per cent. ash and other combustibles. The following calculations are based on burning 1 lb. of this coal per unit of time. If it could

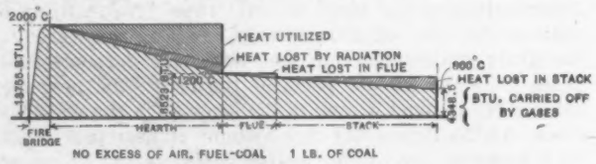


Fig. 1.

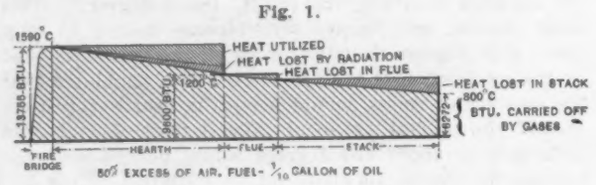


Fig. 2.

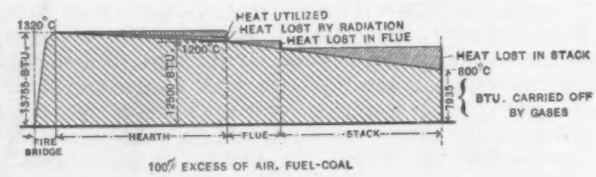


Fig. 3.

Diagrams of the Heat Used and Lost in Grate Fired Furnaces.

be burned completely without excess of air and the fuel and air were admitted at 0 degree C. (32 degrees F.), the combustion would yield 13,755 B.t.u, sufficient to heat the combustion gases to 2150 degrees C., which is, therefore, the maximum theoretical temperature obtainable by the combustion of coal in cold air.

It was stipulated before that the temperature of the gases leaving the hearth (or the space around the muffle) should be not less than 1200 degrees C (2192 degrees F.), at which they would contain 6523 B.t.u. per pound of coal burned. The difference, 7232 B.t.u., must, therefore, be absorbed either by the charge (or muffle) or by the brick work of the hearth and radiated.

Taking the heat radiated as proportional to the temperature, which is approximately correct, of these 7232 B.t.u. about 1500 B.t.u. might be radiated and the balance of 5732 B.t.u. absorbed by the charge. Even in this purely hypothetical, in reality absolutely impossible case, only five-twelfths of the heat would be utilized in the strict sense, while seven-twelfths would be lost. In practical operation it does not matter how this heat is lost after the gases have left the hearth, whether by radiation in flue or stack, or with gases emitted by the stack, and this part is omitted from consideration. This hypothetical case of combustion is illustrated in the diagram, Fig. 1, in which, beginning at the left, the liberation of the heat is shown by the rise of the curve (the abscissæ to which

* Vollkommer & Co., Pittsburgh, Pa.

represent the number of B.t.u.), while the gases (flame) pass over or around the charge to the flue.

Combustion with 50 Per Cent. Excess Air.

Now consider the combustion of 1 lb. of coal with an air excess of 50 per cent., which is scarcely practical in a grate fire, as the stack probably would emit a fairly dense volume of smoke unless the coal bed was kept in a remarkably good condition. By substituting 1-10 gal. of fuel oil for 1 lb. of coal, both of which contain about the same number of B.t.u., it is entirely sufficient if the amount of air used for the spray and for final combustion exceeds the theoretical amount by 50 per cent. This is illustrated in Fig. 2. The same number of B.t.u. are liberated as before, 13,755, and if these are absorbed by the combustion gases, which now include 87 cu. ft. of air (when at 0 degree), a temperature of only about 1590 degrees C., or 2890 degrees F., will be obtained. Even here this temperature will never be reached, because the combustion is not simultaneous and a small part of fuel gases will always escape unburned.

Combustion with 100 Per Cent. Excess Air.

The plain grate furnace, the combustion in which is illustrated in Fig. 3, always requires a very great excess of air, and analyses of the stack gases show that on the average about double the theoretically required quantity is admitted. This great excess is necessitated by the irregularities in the layer of coal, where frequently thin spots of the coal bed allow streaks of air to pass through the grate without mixing well with the carboniferous gases from the thicker parts of the bed. The heat developed by a pound of coal is the same as in the previous cases—13,755 B.t.u.—but this amount of heat has to act on a large volume of combustion gases, as the excess of air amounts to about 123 cu. ft. (at 0 degree). This much diluted gas volume will become heated to only about 1320 degrees C. if it absorbs all the heat developed by the combustion of the fuel. As it was stipulated that the combustion gases should leave the hearth (or space around the muffle) at about 1200 degrees C., only the difference of about 120 degrees would be available for heating the charge (muffle) and for radiation. This difference at these temperatures would mean a difference in energy of 12,500 B.t.u., so that not more than 1255 B.t.u. out of the total heat liberated could be absorbed by the charge and brick work. If the latter is assumed, the radiation through the brick work of the hearth, at 500 B.t.u., which is rather too low than too high, only 755 B.t.u., or nearly one-eighteenth, only is utilized or absorbed by the charge (or muffle), while seventeen-eighteenths of the total heat generated is lost for practical purposes.

This remarkably low efficiency would rise if it is not necessary to heat the charge to above 1000 degrees C. To melt a metal or metal mixture melting at 500 degrees C. so that the gases could leave the hearth at, say, 600 degrees C., only 5909 B.t.u. would be carried off. Allowing the same amount for radiation as in the previous case (500 B.t.u.) of the 13,755 B.t.u. liberated by the combustion, 7346 B.t.u. could be absorbed by the charge, or nearly 50 per cent. of the liberated heat. This example serves to show that for low hearth temperatures plain grate combustion can be fairly economical, and expensive devices for preheating the combustion air would be out of place. On the other hand, the higher the temperature of the hearth the less economical the grate fired furnace becomes. The difficulty of keeping the grates uniformly covered has led to the adoption of gas fired furnaces.

Advantages of Gas.

The writer has frequently met those having the erroneous impression that by first converting the fuel into gas more heat could be obtained per pound of fuel. In fact, just the opposite is the case, and the heat carried off by radiation and other causes in the producer is irretrievably lost, and this loss is generally between 10 and 15 per cent. The advantage of producer gas is, therefore, not caused by the liberation of more heat, but by the reduction of the quantity of combustion gases to be heated by the liberated heat. It has been found possible to mix the gas and air so well that an excess of only 5 to 10 per cent. of air is required to obtain nearly perfect combustion. Thus a well constructed and well operated gas furnace can come within 15 to 20 per cent. of the efficiency of the combustion in the first illustration, where no excess of air was allowed. This process of combustion is illustrated in Fig. 4, where very little drop in temperature was allowed in the fuel, which would hold good only for very short flue connections.

The loss of heat and consequently the reduction of the maximum temperature is the more pronounced the cooler the gas enters the furnace. For one or only a few furnaces it is, therefore, preferable to attach the producer to the furnace, so as not to lose heat by radiation in the flues. By this arrangement one also avoids the trouble of deposition of soot in the flues, which, especially in hot working producers, necessitates frequent cleaning out (burning out) of the flues. For numerous furnaces the inconvenience of hauling the fuel and cinders to and from the different furnaces proves generally a greater nuisance, or evil, than the loss of heat by radiation in the flues, and a central producer plant with flues leading to the different furnaces is preferable. Here also may be considered the question of whether producers should be blown with air alone or with steam injection.

Without going far into theoretical consideration, it can be said that where the gasification takes place near the furnace, air blast will be better than steam injection. Steam is no fuel and, therefore, cannot develop heat, and the admitted or injected steam, which has a very great capacity for absorbing heat, will leave the hearth at a

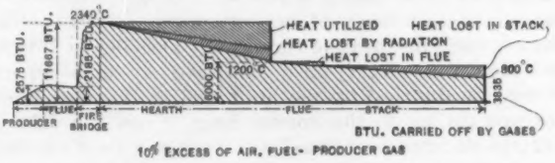


Fig. 4.—Heat Diagram for a Gas Producer Fired Furnace.

certain temperature (in the comparative case at 1200 degrees) with all the heat it carries at that temperature. If enough steam is admitted so that one-quarter of the oxygen required in the producer for gasification is supplied by the oxygen contained in the steam (as is frequently the case) the waste gases will contain about 11.8 cu. ft. (at 0 degrees C.) of steam per pound of coal, which will carry off (at 1200 degrees C.) about 826 B.t.u. which would be saved in the case of air blast. On the other hand, when the steam is decomposed in the producer into its components, hydrogen and oxygen, this process of decomposition can take place only by the absorption of a further great quantity of heat (3370 B.t.u.). If the steam is thus decomposed its constituents may be cooled down to the lowest temperature, but they will always carry with them this latent heat until it is again liberated by combustion and converted into sensible heat. The decomposed steam, or, rather, its constituents, being almost unsurpassed carriers of latent heat, are used to advantage where the producer gas is cooled very much before reaching the combustion chamber.

If the gases derived from the gasification of 1 lb. of coal were cooled down to 0 degree C. before reaching the furnace, the amount of heat liberated in the final combustion would be in the case of one-quarter mixed gas about 3370 B.t.u. larger than in the case of air blast (or Siemens gas). This assumes a case which probably will never occur in practice, but all cases in practice lie between these two extremes, and by making allowance for the proportions of moisture or steam to the injected air, one will be able to at least approximate the real conditions.

Aside from the above consideration another fact renders the use of steam blast in producers commendable, if not to the furnaceman, at least to the producer attendant. The presence of steam in the blast air renders the cinders far more friable and loose, making it less difficult to break up the clinkers, which with dry air blast cause considerable muscular exertion. The furnaceman, however, must make up his mind to the fact that the presence of steam in the combustion gases has, according to tests lately made in Germany, a somewhat

injurious effect on the brick work, which evil effect is more noticeable the oftener the temperatures change.

Air and Gas Preheating.

It has been shown that the higher the temperature of the hearth, or the working temperature, the lower the efficiency of the furnace. Therefore where high temperatures are needed, if they can be obtained at all in grate fired furnaces, their utilization is so limited as to make the process too costly. In this case a remedy is furnished by the preheating of either the combustion air alone or of preheating both the air and fuel gas. The preheating of the air in grate furnaces is not feasible, as it would tend to speedily destroy the grate bars, which even with cool air are subject to frequent repairs. The preheating of air is, therefore, applied only to oil fired and to gas fired furnaces. The least expensive source of heat by which to preheat the air (and gas if the latter is also preheated) are the waste gases, or the combustion gases, leaving the hearth at high temperature (in the comparative investigation only at 1200 degrees C.). There are two methods in practical use to thus utilize the heat of the waste gases, the regenerative and the recuperative.

Regenerative Method.

The first, invented by W. Siemens, consists in the use of two (or four) chambers filled with loosely piled brick or checker work, through one (or two) of which the waste gases are converted on their way to the stack. After this checker work has been thoroughly heated the current of the gases is reversed by a set of valves. Then the combustion air (and fuel gas) is conducted through the hot checker work and thus preheated on the way to the combustion chamber, while the waste gases return through the other chamber or chambers. Every time the heat of the checker work becomes exhausted by imparting the heat to the air (and gas) the valves have to be reversed again.

The advantage of this arrangement is the high temperatures to which the air (and fuel gas) can be heated and the ease of renewing the checker work after it has become defective. The disadvantages are the changes in temperatures (very high after each reversal and low after the heat in the checker brick has been partially absorbed by the air and the gases); the necessity of frequent reversals of the valves, especially when the furnaces get thoroughly hot, which reversals require considerable attention on the part of the men, if they are to be properly timed, and also cause considerable loss of fuel gas, as the volume of gas in the chamber at the time of the reversal is allowed to escape unburned to the stack, and the space which the checker chambers and the reversing valves and flues occupy. With all these objections, the regenerator is the best and safest furnace for very high temperatures.

Recuperative Method.

Lately another method of preheating the air has been greatly improved, which, especially for small and medium size furnaces with high temperatures, is likely to replace regenerators to a considerable extent. This is called recuperation and consists of conducting the hot waste gases through a system of tubes of refractory material around which the combustion air is compelled to take its way before reaching the combustion chamber. No reversing of air and gas takes place, both flowing uninterruptedly in the same direction, whereby the costly valve mechanism and the trouble of operating it is saved. No fuel gas is lost by the reversing, far less room is required and the cost is somewhat less than that of a regenerator system. The temperature, owing to the abolition of reversing, is far more uniform. The objection which was frequently raised against this type of furnace, that the recuperative tubes or channels were difficult of access and difficult to repair, has been to a great extend remedied, as in modern constructions the tubes can be inspected, cleaned and even minor leaks repaired without stopping the operation of the furnace.

On the other hand, the recuperator tiles are more likely to break than checker bricks, and one broken tube necessitates removing and relaying a number of other tubes. Notwithstanding the greater uniformity of temperature (compared with regenerators) a certain expansion and contraction of the tubes is unavoidable and will result in a certain amount of leakage. Considering, however, that the waste gases contain about 21 per cent. more heat units than the air required for final (secondary) combustion could possibly absorb even if heated to the same temperature, which is not possible, a moderate amount of leakage from the air spaces around the tubes to the inside and to the stack will not affect the efficiency considerably. The fact remains that, especially in Germany, recuperative furnaces find very great favor, and are built in large numbers to the advantage of their owners if applied in the proper place.

The thermal calculations for either of these modifications are equivalent. By either method, if 1 lb. of coal is gasified and burned, the same number of heat units is obtained as in the direct coal fired furnace (less the loss in the producer); that is, about 11,667 B.t.u. (See Fig. 5.) If the secondary or combustion air is heated to 1000 degrees C. it brings further 2828 B.t.u. into the furnace, bringing the total heat available up to 14,495 B.t.u. The gases leaving the hearth (as above stipulated) at 1200 degrees carry off only 6000 B.t.u. The difference, 8495 B.t.u., is available for heating the charge and for radiation. If this latter is assumed to be 1600 B.t.u., out of the 13,755 B.t.u. contained in 1 lb. of coal, about 7895 B.t.u. could be absorbed by the charge, or about 43 per cent.

The 6000 B.t.u. carried away from the hearth by the

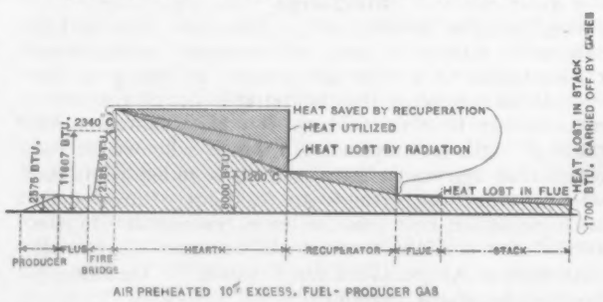


Fig. 5.—Heat Diagram for a Gas Producer Fired Furnace with a Recuperator.

combustion gases are not allowed to go to the stack, but are used to preheat the air. It takes 2828 B.t.u. to heat the required quantity of secondary air to 1000 degrees, and if about 2000 B.t.u. is allowed for loss by radiation from the recuperator, the combustion gases would leave the recuperator with 2172 B.t.u., or with a corresponding temperature of about 400 degrees C. Recuperative furnaces are in operation in which the combustion air is preheated to a temperature only 20 to 25 degrees lower than the temperature of the gases leaving the hearth. The combustion is so nearly perfect that 19 per cent. of carbonic acid is found in the stack gases, while 21 per cent. would be the highest possible percentage in the combustion of average Pittsburgh coal.

Conclusions.

Coal grate furnaces are fairly economical for low temperatures, especially if a large volume of gases is desired. The large excess of air in this case renders the flame oxidizing, which is generally desired in muffle furnaces for enameling and ceramic furnaces. On metal articles this flame would produce a heavy scale, or oxidation, and in metallurgical furnaces (especially a deep fuel bed for iron and steel) producing a reducing flame with little or no air excess, and consequently with high temperature is preferable. With working temperatures above 1000 degrees C. and for continuous operation the installation of recuperative or regenerative furnaces will prove a good investment.

While the foregoing data may assist the furnaceman in comparing the merits of the different processes of combustion, the nature of the products, the cost of fuel, labor and maintenance, and the construction of the furnace and its first cost, and other local conditions, make it necessary to study each case individually, to consider every factor having an effect upon the efficiency, usefulness and durability of the furnace and, after selecting the proper type, to modify the construction to suit the special requirements.

Customs Decisions.

Flexible Metallic Tubing.

After the taking of much testimony, the Board of United States General Appraisers has decided that flexible metallic tubing composed of an inner metal tube with a woven wire covering is subject to a duty of 45 per cent. under the tariff provision for "manufactures of metal." The wire covered tube or hose is made up of a combination of different metals. The merchandise was classified variously as manufactures of metal and as articles made from wire. The New York Flexible Metallic Hose Tubing Company alleged that all the tubing should be admitted under the paragraph in the tariff law for metals. The testimony shows that the woven wire added to the pipe or tube represents but 20 per cent. of the cost of the entire article. This being so, the board holds that the classification of the tubing as a manufacture of wire is erroneous. After discussing the question of the classification of the tubing at length, General Appraiser Fischer says in part: "We hold that steel tubing covered with brass wire, or copper pipes covered with iron wire, are not to be regarded as either 'iron or steel tubes,' or as 'copper pipes,' but are dutiable as manufactures of metal under paragraph 193. The protests are sustained."

Fireplaces.

Iron parts of mantels or fireplaces are held by the board to be entitled to entry as "castings," with a duty of eight-tenths of 1 cent per pound. According to the collector, the merchandise is dutiable at 45 per cent. under the provision in the tariff law for "manufactures of metal." General Appraiser Fischer, who writes the decision for the board, says that it is found from the testimony that the articles are castings of iron upon which no labor has been bestowed subsequent to the casting process. The board holds that the articles are fairly within the provision for "castings." On this account the protest is sustained.

The Cement Production in 1908.

The total production of all kinds of cement in the United States during 1908, as shown by returns received by the United States Geological Survey from all the cement producers of the country, amounted to 52,775,925 barrels, valued at $44,376,656. This total was made up as follows, compared with 1907:

	1908.		1907.	
	Barrels.	Value.	Barrels.	Value.
Portland cement..	51,002,612	$43,472,679	48,785,390	$53,992,551
Natural cement..	1,621,862	808,509	2,887,700	1,467,302
Puzzolan cement..	151,451	95,468	557,252	443,998
Totals.....	52,775,925	$44,376,656	52,230,342	$55,903,851

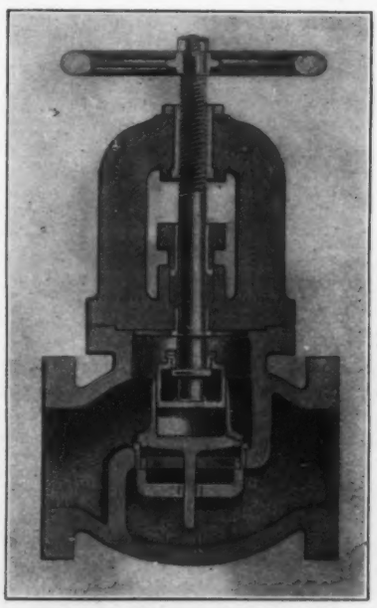
The Portland cement production showed a heavy decrease in 1908 as compared with 1907 in most of the Eastern and Southern States, the loss being greatest in Pennsylvania, New Jersey, New York and Michigan. This decrease in the East and South was offset, however, by remarkable gains reported by plants in the Middle West and on the Pacific Coast, returns from Indiana, Illinois and California showing large increases over the production in 1907.

The average price of the entire Portland cement output in 1908 was only 85 cents a barrel—36 cents below the average price in 1907. The 1908 price is the lowest on record, the previous low point—88 cents a barrel—having been reached in 1904 as the result of business depression in that year.

An Important German Undertaking.—Some big plans are being worked out by the Gelsenkirchen Company, in Westphalia, Germany, which was originally a colliery concern pure and simple. In 1904 the management determined to go into steel manufacture, and subsequently acquired the Aachener Huetten Aktienverein, with steel works at Rothe Erde, and on property and blast furnaces in the Minette District. At the same time the Schalke Gruben u. Huetten Verein was taken in with blast furnaces and foundries. Even then these plants did not consume more than a small part of the 8,500,000 tons of coal, and only about one-half of the 2,200,000 tons of coke produced by the company. It has now been determined to locate new blast furnaces, steel plant and rolling mills near the ore property of the company in the Minette District, either at Deutsch-Oth, in Lorraine, or at Esch, in Luxemburg, rolling the heavier lines. The more highly finished products are to be made at Rothe Erde, near Aix-la-Chapelle, while wire is produced at Eschweiler, in Westphalia. The total sum of $11,000,000 is to be spent for the plant in the Minette District. A harbor is to be built on the Rhein-Herne Canal at Gelsenkirchen, to cost $1,000,000, and $500,000 is to be spent on extending the foundries there. Coking plants and workmen's buildings are to absorb $2,500,000 more, making the total appropriation $15,000,000. Of this $3,500,000 will be used in 1909, about $5,500,000 in 1910 and $4,375,000 in 1911.

The Lunkenheimer Non-Return Boiler Stop Valve.

A reliable non-return stop valve on each boiler when several are operated together is necessary for safety, and in some countries is required by law. When several boilers are connected to a common header it is evident that if a tube is blown out or a fitting ruptured the steam from the battery of boilers will rush into the header and discharge through the boiler which is disabled. The difficulty of closing a stop valve in the event of such an accident is apparent. The Lunkenheimer Company, Cincinnati, Ohio, has designed a non-return boiler stop valve which is claimed to entirely overcome this danger. This valve is intended to be placed between the boiler and header. It prevents steam being turned into it when it has been cut out for cleaning or repairs, for the reason that the valve cannot be opened by hand. It can, however, be closed by hand the same as any other stop valve.



A Non-return Boiler Stop Valve Made by the Lunkenheimer Company, Cincinnati, Ohio.

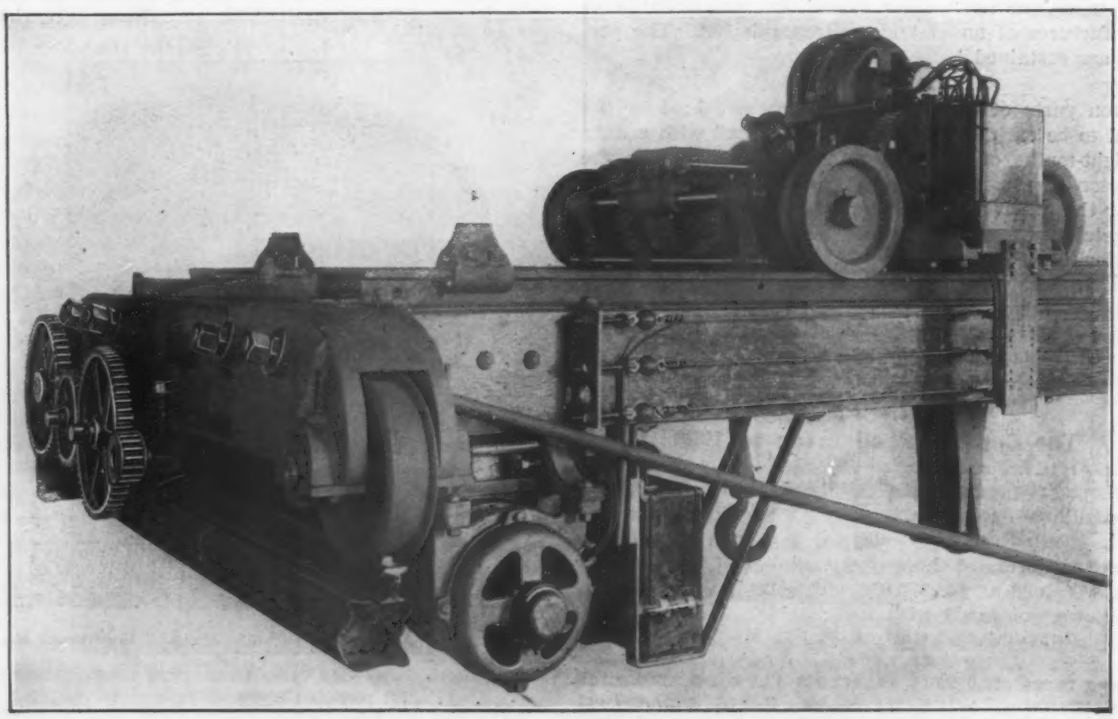
The company states that these non-return valves are made only of the best materials, and that the areas are unusually large and free. The internal dashpot and piston prevent chattering of the disk. All wearing parts are made of bronze, and the gland and stuffing box are bronze bushed. For use with superheated steam these valves are made of puddled semi-steel, with nickel trimmings and nickel-steel stems. The valves are made in sizes from 4 to 10. in. inclusive, and can be furnished with screw or flange ends.

The Speedwell Car Company, Dayton, Ohio, has increased its capitalization from $50,000 to $200,000, and it is announced that the company will build a large addition to its plant.

The Lane Electric Crane.

A new type of electric traveling crane has recently been put out by the Lane Mfg. Company, Montpelier, Vt., builder of the Anderson rope driven traveling cranes, which are largely used by stone workers on account of their simplicity, efficiency and low price as compared with the ordinary type of electric crane. While this new electric crane is more expensive than the rope driven machine it is cheaper than the usual type of electric cranes, and it is claimed to be very economical of current.

The motors run in one direction only, whereas in all other cranes the motor armatures (often running at speeds above 1000 rev. per min.) must be stopped, reversed and brought up to speed again for each change of motion in the hook, trolley or bridge, whereby a good deal of current is wasted. The motors are connected by rawhide spur bearing to beveled paper and iron friction wheels, by means of which the reverse motions are effected and controlled. This arrangement also does away with the third motor, one motor on the bridge and another on the trolley being all that are required. The latter operates both the trolley travel and the hoisting mechanism, but owing to the peculiar combination of frictions both these motions are as independent as if a separate motor were provided for each.



An Electric Crane Particularly Intended for Stone Workers, Built by the Lane Mfg. Company, Montpelier, Vt.

The motors used are of General Electric Company's make and of inclosed dustproof type. In shops where stone is cut this is an important feature, as the dust soon penetrates into the bearings of unprotected motors. Owing to the fact that the armatures run constantly in one direction they act as flywheels to equalize and compensate the fluctuating demands for current, especially when loads are applied suddenly. The electrical connections are all made with consideration for reliability and safety, as well as convenience, and ample grounding takes care of any possible leakage that might otherwise give the hook man a shock.

The starting box switches of both motors are controlled from the operator's seat, which is located at one end of the trolley. From this position the driver has an unobstructed view of his work. The little trolley wheels which make the contact with the current source are provided with metallic bushings which never need oiling, and every important bearing in the machine is provided with grease cups in addition to the usual oil arrangements. Both the trolley and the hoisting trains are driven through worm gearing running in an inclosed casing fitted with heavy grease and flake graphite, and these are fitted with stuffing boxes to prevent the grease working out in hot weather. In all other ways care has been taken to prevent any dripping of oil or grease from the crane upon the work that might be beneath.

Ample provision is made for taking up wear at all important points, as well as for keeping the paper and iron friction wheels in proper contact and alignment. The paper or fiber shells can be easily replaced when worn out, and the paper wheel is in all cases the driving member of the pair in these cranes. This does away with all tendency of the paper to wear into ridges or out of round, which often happens where the opposite plan is followed. Owing to the use of worm gearing in the hoisting mechanism brakes are hardly needed in this crane. They are provided, however, but are seldom used except to prevent racing of the worm in lowering a heavy load.

So far these cranes have only been made with the bridges of Southern pine trussed with wrought iron rods, but the maker expects to be able to offer them at an early date with steel bridges when such are required. For spans not exceeding 50 ft. the timber bridge is satisfactory and can be sold at a much lower price than the steel bridge. With the exception of the hoisting rope and hook these cranes are designed to have a factor of safety of five in all parts. The reason for making the exceptions named is to protect the more expensive portions of the machine from serious overloading, as well as to insure that such overloading would be indicated by a gradual failure of the rope or hook rather than in a sudden yielding of some more rigid member. These cranes have on several occasions lifted and carried loads of more than two and one-half times their rated capacity. This was done without injury or apparent effort, though such practice is not advised.

Algerian Iron Mines.—The iron ore deposits at Ouenza, Algeria, which have attracted considerable attention of late, are estimated to represent 60,000,000 to 80,000,000 tons of ore. They are owned by the French Government, which has given a concession to the Société d'Etudes d'Ouenza, dependent upon the construction of a railroad from Djebel Ouenza to Bône for the transport of the ore. The syndicate is composed of English, French, Belgian and German iron and steel firms. The firm of Krupp belonged at first but has withdrawn. Besides building the railroad the concessionists are to pay

a minimum fee of 150,000 francs, taking 1,500,000 tons of ore the first year, and rising to 650,000 francs the fourth year from the commencement of working, with a sliding scale for subsequent years. As soon as the aggregate fees paid amount to 15,000,000 francs, the syndicate is at liberty to reduce the output to 150,000 tons, with an annual fee of 112,500 francs.

The New Morrow Drill Chuck.

In the latest design of drill chuck made by the Morrow Mfg. Company, Elmira, N. Y., a releasing device is attached to the threaded sleeve, through which a drill may be instantly released by hand with comparatively little resistance. No spanner or wrench is required, and it is said to be the only chuck of over ½-in. capacity of which this is true. The roller operated chuck is the nearest approach to it, but its capacity is limited. Fig. 1 shows the exterior of the chuck and Fig. 2 a longitudinal section of one specifically designed to drive taper drills from which the tangs have been twisted.

The body of the chuck is 3 in. in diameter by 4 in. long and will hold Nos. 1, 2 and 3 taper shanks. This

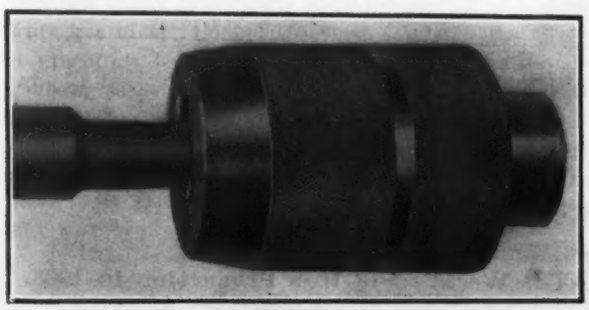


Fig. 1.—The New Hand Manipulated Drill Chuck Made by the Morrow Mfg. Company, Elmira, N. Y.

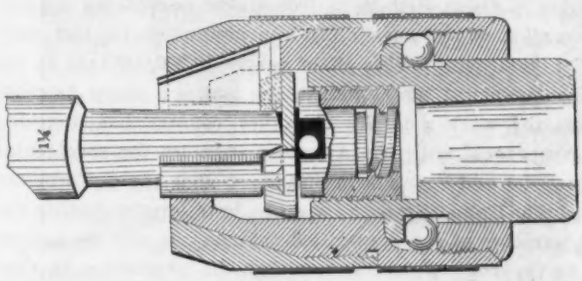


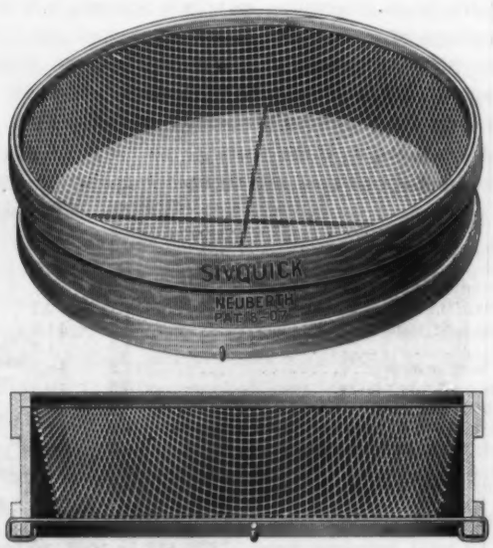
Fig. 2.—Longitudinal Section of the New Morrow Drill Chuck.

gives a range of ⅛ to 1¼ in. drills. The chuck will safely carry the 1¼-in. drill to its utmost capacity, automatically gripping it without slipping and releasing by hand. There are no exposed threads on the chuck or projections of any kind. The threads being all inclosed, are protected from injury or fouling with dirt or chips. It will be seen from the sectional view that when the central part—that fitting the drill spindle—is held stationary and the knurled outside shell is turned, the jaws are advanced or retracted, and in drilling, the harder the drill is pushed the stronger is the gripping action. When it is desired to release the drill the differential screw arrangement first removes the binding pressure on the back of the jaws and the further revolving of the shell draws the jaws into the casing. The ⅜-in. balls interposed between the collar and the flange so reduce the friction as to make the hand releasing and tightening possible. These parts are hardened and ground accurately to size. The chuck just described is known as the No. 5½. Two other sizes of the same style are made, No. 4 taking from ¼ to ¾ in. straight shank drills and No. 5 taking from ½ to 1 in. straight shank drills.

Australian Iron and Steel Bounties.—The new iron bounty act of Australia provides for the payment of £150,000 at the rate of 12 shillings a ton on pig iron made from Australian ore, puddled bar iron made from Australian ore, and steel made from Australian pig iron. It also provides for a payment of £30,000 on galvanized sheet or plate iron or steel, made from Australian ore; wire netting (not prison made), and made from Australian ore or from wire manufactured in the United Kingdom; wire made from Australian ore; iron or steel tubes (not riveted or cast) not more than 6 in. internal diameter, made from Australian pig iron or steel, all at the rate of 10 per cent. on value. One company having been refused a bounty on steel under the former act because foreign scrap had been used in part in its manufacture, it is now provided that a bounty may be paid on all steel made in Australia which contains local pig iron, notwithstanding that a proportion of imported or local scrap is used. The bounty for pig iron must be claimed before June 30, 1914, and not more than £30,000 will be paid in any one year. In the 10 per cent. list the bounty expires June 30, 1912. The new act takes effect from January 1, 1909.

The Osborn Sivquick Foundry Riddle.

What is considered to be a radical improvement in foundry riddles is the Sivquick, made by the Osborn Mfg. Company, Cleveland, Ohio. Its construction is clearly shown by the illustrations. Instead of attaching the wire cloth in the usual fashion around the bottom circumference of the riddle, it is drawn into basket shape and hung over the top of the riddle, the sides of the



The Sivquick Foundry Riddle, Made by the Osborn Mfg. Company, Cleveland, Ohio.

wire cloth hanging free from the sides of the riddle rim. This construction known as "Neuberth's patent" has its principal advantage in the fact that it increases the amount of sifting area without increasing the size of the riddle and eliminates the clogging of the sand around the inside edge of the riddle, as with the old style. The clinging of the moist sand to the rim causes the wire to rust. This, together with the constant knocking of the riddle on the flask, soon breaks the wire cloth.

The Sivquick construction leaves the inside of the basket always clean; the sand shakes through freely and cannot clog around the bottom edge; neither is it necessary to throw scrap iron or gaugers into the sand to facilitate the sifting, as is commonly done, especially with power shakers. The Sivquick is protected with extra heavy battens at top and bottom to withstand the hardest usage, and severe rapping of the flask does not break the rims or loosen the wire. The wire baskets are made of full weight, foundry grade galvanized cloth of the best quality. They are strong and rigid, and are protected at the bottom with two heavy copper wires placed at right angles.

The riddle is peculiarly able to increase the output with power shakers. The manufacturers guarantee it to sift twice as much sand in a power shaker as any ordinary riddle of the same size and mesh, and to do it without the help of scrap iron, which is destructive of a riddle.

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The Proportionate Output of Steel Corporation Products.

The recent trend of demand in different steel products is shown in an interesting way by a presentation of the percentages of the several lines of output of the United States Steel Corporation. Its annual reports give the tonnage of different lines as shipped to outsiders, and from them the following percentage table has been computed for the past three years:

United States Steel Corporation's Steel Products.—Per Cent.

	1906.	1907.	1908.
Rails	18.7	16.7	16.9
Billets, sheet bars, &c.	10.4	7.3	8.9
Plates	7.9	8.5	5.0
Structural shapes	5.9	5.7	5.1
Merchant mill products and skelp	11.7	12.7	9.3
Tubing and pipe	9.7	11.3	10.5
Rods	1.1	1.2	1.5
Wire and products	13.2	14.3	20.6
Sheets and tin plates	10.5	10.3	12.4
Finished structural work	6.1	6.9	6.5
Angle and splice bars and other rail joints	1.7	1.9	1.4
Spikes, bolts, nuts and rivets	0.7	0.7	0.6
Axles	1.7	1.8	0.4
Sundry steel and iron products	0.7	0.7	0.9
Totals	100.0	100.0	100.0

The total tonnages were 10,578,433 in 1906, 10,564,537 in 1907 and 6,206,932 in 1908.

Rails are conspicuous rather by their failure to present any remarkable movement. The popular impression has been that the demand for rails has suffered a distinctly greater decline than the demand for other steel products, but that is hardly the case. The decrease in demand was really in 1907, as compared with 1906, as the tonnage of all products was about the same in 1907 as in 1906 in the case of both the Steel Corporation and other manufacturers, while there was a decrease in rail tonnage of about 10 per cent. That, however, was not excessive, and in 1908 rails constituted the same proportion of the Steel Corporation's total output as they did in 1907, the Tennessee Company's tonnage being included in both 1907 and 1908.

The Steel Corporation's tonnage of billets, sheet bars, &c., shipped to outside finishing mills on sliding scale and other contracts decreased from 10.4 per cent. in 1906 to 7.3 per cent. in 1907, and in 1908 showed a slightly increased percentage of the reduced total.

A striking decrease in the proportion of plate tonnage is shown in 1908, as the proportion of the Steel Corporation's total tonnage in 1908 was less than two-thirds as great as the average in 1906-7, and the decrease was not a progressive one, as the plate tonnage was larger in 1907 than in 1906. A slight decrease in the proportion in 1908 is shown by steel bars, hoops, bands, cotton ties and skelp. The proportion of tubing and pipe has remained about stationary.

A remarkable increase is shown in the proportion of wire to total output, the percentage in 1906 being 13.2; in 1907, 14.3, and in 1908 no less than 20.6. There was really only a slight decrease in the actual tonnage from 1907 to 1908—namely, from 1,481,226 to 1,275,785. The small decrease in the wire rod production of the country and the close approach of wire rod tonnage to rail tonnage were referred to a week ago.

A remarkable steadiness is shown in the proportion of fabricated steel to total output, the proportion in 1908 being exactly the average proportion in 1906-7. A great decrease, by the way, is shown in the corporation's axle output, which fell from 189,006 tons in 1907 to 24,057 tons in 1908.

Throughout the comparison just made there runs the tendency for the cheaper products to decrease in proportionate tonnage, while the more finely finished products have increased. Rails, crude steel, plates and merchant mill products decreased notably; plain structural shapes and fabricated material remained stationary in their proportion, while all wire and sheet products showed notable increases in the proportionate tonnage furnished. It is partly on this account that the earnings of the Steel Corporation were so well maintained during a period of greatly reduced output.

The World's Pig Iron Production in 1908.

The publication of the statistics of pig iron production in Great Britain in 1908 makes possible an approximation of the world's pig iron production for last year. Naturally the falling off of nearly 10,000,000 tons in the production of the United States makes a sharp decrease in the world's total. No other country has anything comparable with the American capacity for spectacular ascents and descents in output, so that the performance of the United States in a given year largely decides the character of the aggregated returns. It will be noticed in the figures given below that the production in Germany, Great Britain and France fell off comparatively little. Thus the output in the United States, which in 1906 and 1907 was within a few hundred thousand tons of the combined outputs of all three countries, last year fell short about 8,300,000 tons of their total. A table similar to the one below was given in *The Iron Age* of April 16, 1908, metric tons being reduced in both cases to gross tons for the sake of uniformity. A few changes have been made in the figures given last year, where later returns required them:

The World's Pig Iron Production in 1906, 1907 and 1908.

	1908.	1907.	1906
	Gross tons.	Gross tons.	Gross tons.
United States	15,936,018	25,781,361	25,307,191
Germany	11,615,637	12,836,524	12,280,879
Great Britain	9,289,840	9,923,856	10,149,388
France	3,336,761	3,531,378	3,314,100
Russia	*2,600,000	2,775,365	2,661,029
Austria-Hungary	*1,650,000	1,842,649	1,687,581
Belgium	1,187,090	1,384,414	1,354,033
Canada	563,672	581,146	541,957
Sweden	554,266	605,901	595,231
Spain	†373,248	†373,248	373,248
Italy	†110,432	110,432	135,296
Japan	†42,919	42,919	41,994
Other countries	200,000	200,000	200,000
Totals	47,459,883	59,989,193	58,643,297

* Estimated. † Previous year carried forward.

The accuracy of the figures for the minor producers of pig iron cannot be vouched for, but the total is within a fraction of 1 per cent. of the actual in any event. In

the case of Great Britain the statistics are those compiled by the British Iron Trade Association. It is a matter of surprise that for 1907 these figures differ by 190,000 tons from those of the British Government, which show 10,114,281 tons. The returns for Japan for 1907 are taken from the report of the American Iron and Steel Association, which credits them to "an English statistical journal." With two blast furnaces at the Imperial Steel Works, having a capacity of 160 tons a day each, and with a total of iron ore production and imports of about 200,000 tons in 1907, the production of pig iron was presumably in excess of that given. China's production at the two Hanyang blast furnaces, capacity 120 tons each, is included in "Other countries," but was probably not much less than that of Japan.

The world's production of pig iron may be approximated as follows for the years stated:

Years.	Gross tons.	Years.	Gross tons.
1850	4,400,000	1903	46,000,000
1890	27,000,000	1904	45,050,000
1895	28,700,000	1905	53,700,000
1900	40,200,000	1906	58,650,000
1901	40,200,000	1907	60,000,000
1902	43,400,000	1908	47,450,000

The percentage of the total contributed by the United States, from being 43 per cent. in 1906 and 1907, fell to 33.6 per cent. in 1908.

The National and Other Labor Bureaus.

The National Employment Exchange, which is in process of creation by men representing great financial and industrial interests, has as its purpose the establishment of labor bureaus in various parts of the country, all working together for the better distribution of labor in proportion to the need of it. The institution furnishes the possibility of an important addition to the labor bureau system already in successful operation under the direction of various States and of the several branches of the National Metal Trades Association. The plan, as announced, is, in the beginning, to pay special attention to unskilled labor, which would mean, as a general proposition, that the metal industries would be influenced by the exchange to a less degree than others, for in the manufacturing centers the supply of cheap labor is usually fully equal to the demand. But in the agricultural regions the element of labor is very often the great perplexing factor, farmers being seriously, even vitally, affected by their inability to procure able-bodied men to harvest their crops. Naturally the immigrant will require most of the efforts of the new institution, and great good will be done if a larger proportion of this element of population is diverted from populous centers, and distributed under careful supervision in those parts of the country that have need of muscle rather than brain, leaving those aliens who have had an initial training in industries to swell the number of working people in the shops and mills and factories.

The plans of the exchange do not end with the untrained workman. It is the intention to include skilled labor in the scope of its usefulness later on, and when this work is begun there is promise of its forming an important link in the chain of labor bureaus already established and establishing in the United States. Most essential is the matter of workmen's records. The present labor bureaus have them, and experience is proving that they are invaluable. It has been often stated that no injustice is done to the honest man by maintaining a record of his labor; of his skill, and the specialized direction in which it has developed; of his faithfulness and industry. He is protected against the competition of that class of workman who applies for and receives work under a false statement of his experience. It is, of course, fair that the employer should have knowledge of the men whom he employs. The labor bureaus of the Metal Trades Association have made good headway in the compilation of these records, but they are largely local. The bureaus of different cities co-operate in exchanging information when it is requested, and the practice is on the rapid increase. It will be seen how much a national exchange could assist in this work, especially if it had the co-operation of the State and private bureaus. Perhaps stumbling blocks would be put in the way of a close relationship of local and national bodies, if the latter should develop the power to take skilled men away from the neighborhood of the former, as might happen when business was temporarily dull during a period when workmen were needed in other parts of the country. An example of this condition exists at the present time, when some of the automobile builders are seeking certain classes of skilled help, which would be available to them in other cities if there was a bureau to provide them with the men or the information by which they could be found. Manufacturers might very well resent the withdrawal of so important an element of their working forces which promises to be needed in the immediate future, and would object to their local labor bureau working with a national exchange to that end.

The existence of workmen's records may have an important effect in curbing the hiring away of help of one manufacturer by another. It will be remembered that at the beginning of the last rush of industrial production the striving after labor went to extraordinary lengths. Cities competed vigorously to secure skilled workmen, each robbing the other. Employers were actually swapping workmen, as they hired them one from the other, the only gainer being the men themselves, for they received better wages as a result of the exchange. The spirit of co-operation was lost sight of in many instances in the vital necessity of increasing production in order to meet and reap the profits of the tremendous demand for manufactured goods. The time is not far off when similar conditions of business will prevail. Where labor bureaus exist, with careful records of workmen and their employment, and the agreement on the part of subscribers to register with the bureau all men leaving their employ and all those put on the payrolls, the chance for an exchange of workmen under the conditions as enumerated must be reduced. The records show up the transaction. Presuming that they are open to the inspection of the members, the existence of a systematic seeking of workmen by unusual inducement must become apparent quickly. Of course, this will be no absolute deterrent, but it will be an excellent influence and will fit in with the information of the records as to what workmen have been given in wages, which is a corrective of false statements made by applicants for work as to their skill and what they have received from former employers.

A Bonus Plan That Abolished Night Shifts.

The wastefulness of night work in machine shops has been repeatedly a matter of comment. A striking example of a successful attack on this problem and on the larger one of increasing output to an extent that would obviate the apparent necessity of building additions is reported of a Western plant turning out heavy machinery. To-day 350 men are making a greater output, working only in the daytime, than was produced by 500 under the old order, when both day and night shifts

were worked. This remarkable result is due largely to the introduction of a well conceived bonus system of paying workmen, marked by liberal rewards for increased output and by judicious handling of the details of the new plan. Friction between departments has been eliminated, and the shop is now an example of the benefits of good team work.

At one time, under the high pressure of demand, night work at this shop was considered indispensable. It was abandoned after a careful examination of the records extending over a considerable period. Observation by the managers through repeated night visits, when their presence was known to but few, gave data which assisted in a diagnosis of the situation. It was found that from 6 to 10 p.m. the work went on in a way fairly comparable with day operations. From 10 to 12 o'clock speed slackened and blunders appeared. After the midnight lunch speed fell off heavily and mistakes were common, several hours being required in the following forenoon to straighten things out.

Rail Mill "Automatics."

In an article on the "Automatic Manufacture of Steel Rails," a contemporary describes a well-known Bessemer rail mill which "employs automatic machinery of the heaviest class." The "automatic" operations in the blooming mill are referred to in these terms:

> The handling of the heavy ingot during its conversion into a bloom, like all the other processes, is without the direct touch of the human hand. Blindingly hot it is forced through the rolls and out on the other side. A steel finger rises out of the runway, the ingot lifts up and turns over on its side. Another rush is made back through the reversed rolls. It stops. Another steel finger lifts and turns the ingot again. The adjusting engines draw the rolls nearer together; the feeding train reverses, and back the ingot goes again through the rolls.

Six separate operations are mentioned here, each of which represents the direct intervention of an operator. Prudential reasons might seem to dictate the manipulation of hot ingots without the "direct touch of the human hand," but it has probably not occurred to many engineers that these were sufficient to give rolling mill equipment a place among the "automatics."

CORRESPONDENCE.

The Duty on Ferroalloys.

To the Editor: The Dingley tariff law provides a duty of $4 per ton on ferromanganese and on ferrosilicon. They are placed in the same class with pig iron.

The Payne bill provides in paragraph 182: "Chrome or chromium metal, ferromanganese, ferrochrome or ferrochromium, ferromolybdenum, ferrophosphorus, ferrotitanium, ferrotungsten, ferrosilicon, ferrovanadium, manganese metal, molybdenum, titanium, tantalum, tungsten or wolfram metal, 15 per cent. ad valorem."

The Aldrich bill raises the duty on all the foregoing, but it takes out ferromanganese, placing this with pig iron at the reduced rate of $2.50 per ton, and it also takes out ferrosilicon containing not more than 15 per cent. of silicon, classifying this as in the Dingley law at $4 per ton.

The Aldrich bill, paragraph 182, reads: "Chrome or chromium metal, ferrochrome or ferrochromium, ferromolybdenum, ferrophosphorus, ferrotitanium, ferrotungsten, ferrosilicon, containing more than 15 per centum of silicon, ferrovanadium, molybdenum, titanium, tantalum, tungsten or wolfram metal, valued at $200 per ton or less, 25 per cent. ad valorem; valued at more than $200 per ton, 20 per cent. ad valorem. Ferrosilicon containing not more than 15 per cent. of silicon $4 per ton." Ferromanganese is transferred to paragraph 116 with pig iron at $2.50 per ton.

Anybody who is familiar with these products knows that ferromanganese and all ferrosilicon, below or above 15 per cent. silicon, are simply common ferroalloys, used principally in steel mills and foundries to deoxidize the molten steel. These two ferros are a necessary alloy pig for the production of steel and castings, which have always been classified with pig iron. They disappear and are lost in the operation of deoxidizing the molten steel. They do not impart any additional value to the steel, and do not increase the price of the finished article.

This common alloy pig iron, ferrosilicon, used as a deoxidizer, is slipped in among all the high priced ferroalloys, which serve an entirely different purpose.

Ferromanganese and 50 per cent. ferrosilicon, the standard products, sell at the present time from $42 to $58 per ton, but have been classified with high priced ferroalloys selling at more than $200 and up to a few thousand dollars per ton. All these high grade ferroalloys are used for an entirely different purpose. They do not, like ferromanganese and ferrosilicon, serve to deoxidize the metal, and are not wasted or lost; on the contrary, they are added to the steel bath, and remain in the steel, producing a superior article, and they materially increase the price of such steels, which are known and sold in the market as alloy steels.

Ferromanganese and ferrosilicon of 15 per cent. silicon, or less, are used in larger quantities, principally by the large steel companies who produce tonnage steel, whereas ferrosilicon, containing over 15 per cent. silicon, is used by the large steel producers in comparatively smaller quantities and hence is of no importance to them. It is, on the other hand, most generally used by the numerous smaller steel mills and foundries in almost every State of the Union. It is quite an item for them as a deoxidizer, for which they get no return, the metal, as stated before, being lost in the process.

Why these two common ferroalloys were slipped in among the high priced ferroalloys in the House bill and advanced to 15 per cent. ad valorem is a mystery, but it is incomprehensible why the Senate bill takes out ferromanganese, places it with pig iron at $2.50 per ton, and divides ferrosilicon in two classes—namely, ferrosilicon, containing 15 per cent. silicon and less, and ferrosilicon, containing over 15 per cent. silicon, and places the former in a class by itself at $4 per ton, the same as in the present Dingley law, while the latter, containing over 15 per cent. silicon, is retained with the high priced ferroalloys in paragraph 182, at an ad valorem rate of 25 per cent. at an advance of over 400 per cent. of the Dingley rate.

Since both products, being raw materials, are produced in one operation by cheap labor, are used for the same purpose and have always been in the same class, the strange action by both the House and the Senate has certainly caused a surprise to the numerous steel mills and foundries throughout the country.

Ferrosilicon containing more than 15 per cent. silicon is not a new product. It has been produced to any percentage of silicon for nearly 20 years, but has not been used commercially to any great extent until within the last 10 years. Owing to the reduction in price it is becoming more popular with the smaller steel mills and foundries, being preferred by them to lower percentage ferrosilicon, among other reasons because it does not chill the steel bath and can be handled more conveniently.

In view of all the foregoing facts, the singling out of one of three similar products, used for the same purpose, and placing on the one a prohibitive duty about five times as large as on the other two seems strange and incomprehensible.

It can only, therefore, be surmised that the Ways and Means Committee and the Senate Finance Committee have not been properly informed, or have been misled regarding the facts in the case. It does not appear reasonable nor to be the intent and purpose of the present revision.

The proposed prohibitive duty on ferrosilicon containing over 15 per cent. silicon would benefit practically but one producer in this country, and hundreds of consumers of this article scattered over the country would have to pay tribute to a monopoly. FOUNDRYMAN.

Unctuous Dixon's Flake Graphite.

To the Editor: In *The Iron Age* of February 25, 1909, on page 667, an article was printed concerning unctuous graphite. We feel a little like criticising this article, both perhaps in what it says and what it would have the reader infer.

In the first place, we would take exception to the use of the word "unctuous," in that, as it is presented, it might give the reader the impression that the quality of unctuousness was peculiar to a special kind of graphite. If there is any one characteristic of graphite which distinguishes it from all other material, it is this particular one. It might be safely said that all graphites possess this quality, or else they are not graphite. To be sure, there are grades of so-called graphites which are so low in actual graphite as to be but slightly unctuous, but pure graphite always possesses this quality in the highest degree. If the word is used to distinguish one particular grade of graphite from other grades which possess this quality in a less degree, then the use of the word is, of course, entirely correct.

The article also says that graphite lubricants should give a smooth veneer or coating to the parts to be lubricated. This, of course, is evident, but if the surface is to be smooth it certainly cannot be obtained from rough surfaces. The blackness of all amorphous graphite is due to the fact that the surfaces are irregular, because if the surfaces were smooth they would reflect light. Such varieties of graphite only become smooth and reflect light when they have been compressed and take a surface which is equivalent to all natural crystalline graphites.

It is not conceivable that amorphous graphite, or any graphite for that matter, performs any function so long as it is moving about freely in the lubricant which is used to distribute it. It is only when the particles become attached to the metal surfaces that they begin to do their work. The article states also that brightness or blackness in graphite is not an indication of its purity or value. This statement is far truer as applying to amorphous graphite than crystalline graphite. In crystalline graphite it is a very good indication as to its purity, but not its value for any particular purpose; thus the heavy crystalline Ceylon graphite, which is extremely bright and unctuous, is not so available for lubricating purposes as the American flake graphite, which is of decidedly different form. The Ceylon graphite is all crystalline and when pulverized may be compared in shape and size with any kind of granular material like sand.

On the other hand, the American form of crystalline graphite is invariably of the very thin and remarkably smooth variety and which has for years been the standard for lubricating purposes. Neither is the blackness of amorphous graphite a proof of its purity, as it might be obtained in all sorts of ways, the blackness of coal or charcoal or any carbonaceous material being the same as the blackness of amorphous graphite. Furthermore, the test of unctuousness is not without defects when applied to amorphous graphite, for the reason that, while the graphite might contain only a moderate amount of graphitic carbon, it could easily be adulterated with talc or soapstone, which would impart considerable of this quality to it. The bright silvery luster of flake graphite would be impaired to such an extent by such adulteration as to render detection easy, and so this luster is to be considered an indication of quality. It may be stated as an axiom that fineness of pulverization renders adulteration easy.

This statement does not refer so much to the artificial amorphous graphites as to the natural amorphous graphites, whose carbon percentage may be raised by the addition of carbonaceous materials like coal.

JOSEPH DIXON CRUCIBLE COMPANY.

JERSEY CITY, N. J., April 27, 1909.

The Detroit Iron & Steel Company, Detroit, Mich., has given to the Variety Iron & Steel Works Company, Cleveland, the contract for the steel work for the new blast furnace that the former company will erect in Detroit, and on which work will start soon. The contract also includes the castings for the furnaces, the stoves, the structural material for the cast house and blowing engine house, and the trestle and bins. The stack will be 18 ft. 6 in. x 85 ft.

Scrap Iron and Steel Consumption in 1907.

The May issue of the *Bulletin* of the American Iron and Steel Association gives the following compilation of the consumption of mill cinder, scale and scrap iron and steel by blast furnaces, and rolling mills and steel works in the United States, as shown by the statistics of the Bureau of the Census for the years given. Gross tons are used:

	1880.	1890.	1900.	1904.
Blast furnaces.....	316,114	1,145,599	1,600,313	1,865,385
Rolling mills and steel works	1,198,842	1,726,162	4,113,287	5,124,277
Totals.....	1,514,956	2,871,761	5,713,600	6,989,662

The *Bulletin* comments as follows: "The great increase shown in the table in the use of scrap by rolling mills and steel works from 1890 to 1900 and from 1900 to 1904 is explained by the development of the basic open hearth steel process, which actively began late in the 90's, and which has since made wonderful progress. The acid open hearth process is also a large scrap consumer. While no accurate figures are available, it is probable that in 1904 the open hearth process alone consumed approximately 3,000,000 tons of iron and steel scrap, and that in 1907, when the production of basic open hearth steel was more than double that of 1904, the consumption of scrap in the open hearth approximated 6,000,000 tons.

"In the above table the iron and steel scrap consumed by iron foundries, cast iron pipe works, car wheel plants, forges which manufacture scrap bars, &c., is not considered. If the scrap consumed by establishments of this character were included, and due allowance were made for the great increase in consumption by our basic open hearth steel furnaces, it would probably be found that the total consumption of iron and steel scrap, cinder, scale, &c., in this country in the calendar year 1907 would amount to at least 12,000,000 tons and might reach 12,500,000 tons, or almost one-half of our total production of pig iron in that year. The scrap and cinder consumption of 1908 was naturally much less than that of 1907. There was doubtless a large accumulation of scrap in 1908."

Pig Iron Production in Great Britain in 1908.

The British Iron Trade Association, through its secretary, C. J. Fairfax Scott, has published the statistics of pig iron production in the United Kingdom in 1908. The total was 9,289,840 gross tons, which compares with 9,923,856 tons in 1907, 10,149,388 tons in 1906, and 9,592,737 tons in 1905. The most notable decreases in 1908 from the preceding year were in West Cumberland, Scotland, Lancashire, Durham and South Wales, being 193,000 tons in the first named district (from 859,454 tons to 666,612 tons), and 102,000 and 83,000 tons in Durham and South Wales, respectively, while Scotland, which is next in importance to the Cleveland District, fell off from 1,403,447 tons to 1,243,265 tons. The Cleveland District showed an increase last year over 1907, its production being 2,547,446 tons, against 2,433,567 tons in 1907, and 2,639,964 tons in 1906. The production of spiegeleisen and ferromanganese was 46,000 tons more in 1908 than in 1907. The association's report says that the production of basic iron in 1908 was only 44,000 tons less than that of 1906, which was the high record year in pig iron production. On the other hand, the production of hematite or Bessemer pig iron in 1908 was 615,000 tons less than in 1906.

The average number of furnaces in blast in 1908 was 308½, as compared with 366¼ in 1907, 367¾ in 1906 and 346 in 1905. The total number of furnaces in the years mentioned was 508, 507, 517 and 525, respectively. The average output per furnace in blast was 29,970 tons in 1908, as against 27,096 tons in 1907, 27,598 tons in 1906, and 27,724 tons in 1905.

New Provisions of the Senate Tariff Bill.

Finance Committee Reports Revision of Customs Administration Laws.

WASHINGTON, D. C., May 4, 1909.—After a fortnight's deliberation thereon the Finance Committee has reported to the Senate certain administrative features of the new tariff bill of far-reaching importance. They include a substitute for the so-called maximum and minimum section of the bill as passed by the House and a comprehensive revision of the customs administrative act of June 10, 1890, which has now survived three complete revisions of the tariff law.

New Maximum and Minimum Plan.

The Senate substitute for the House maximum and minimum provision is a far more conservative measure, and has been prepared with great care, with a view to meeting all the serious objections that have been raised against the provision as drafted by the Ways and Means Committee. The House bill provided that in the event of the refusal of a foreign country to grant to American products the minimum rates of its tariff, a retaliatory rate of 20 per cent. should be added to the duties assessed on the products of such country when imported into the United States, and should be extended to cover many items on the free list. This provision has been criticised as drastic and is likely to involve this country in tariff wars with Europe. In addition, it is feared that frequently the automatic application of retaliatory rates to raw materials would work greater injury to our own industries than to those of the country against which they might be invoked. The Finance Committee's substitute obviates all these objections. The maximum and minimum section, as reported by that committee, is as follows:

Sec. 2. That from and after March 31, 1910, except as otherwise specially provided for in this section, there shall be levied, collected and paid on all articles when imported from any foreign country into the United States, or into any of its possessions (except the Philippine Islands), the rates of duty prescribed by the schedules and paragraphs of the dutiable list of section one of this act, and in addition thereto 25 per centum ad valorem; and there shall also be levied, collected and paid the following rates of duty on articles upon the free list in said section one, namely:

On coffee, 5 cents per pound; on tea, 10 cents per pound; which rates shall constitute the general tariff of the United States: *Provided*, That whenever and so long as the President shall be satisfied, in view of the character of the concessions granted by the minimum tariff of the United States, that the government of any foreign country imposes no terms or restrictions, either in the way of tariff rates or provisions, trade or other regulations, charges, exactions, or in any other manner, directly or indirectly, upon the importation into or the sale in such foreign country of any agricultural, manufactured, or other product of the United States, which unduly discriminate against the United States or the products thereof, and that such foreign country imposes no export bounty or prohibition upon the exportation of any article to the United States which unduly discriminates against the United States or the products thereof, and that such foreign country accords to the agricultural, manufactured or other products of the United States treatment which is reciprocal and equivalent, then, upon proclamation to this effect by the President of the United States, or any of its possessions (except the Philippine Islands), from such foreign country shall, except as otherwise herein provided, be admitted under the terms of the minimum tariff of the United States as prescribed by section one of this act.

The proclamation issued by the President under the authority hereby conferred and the application of the minimum tariff thereupon may, in accordance with the facts as found by the President, extend to the whole of any foreign country, or may be confined to or exclude from its effect any dependency, colony or other political subdivision having authority to adopt and enforce tariff legislation, or to impose restrictions or regulations or to grant concessions upon the exportation or importation of articles which are, or may be, imported into the United States. Whenever the President shall be satisfied that the conditions which led to the issuance of the proclamation hereinbefore authorized no longer exist, he shall issue a proclamation to that effect, and thereupon and thereafter the provisions of the general tariff shall be applied to the importation of articles from such country. Whenever the provisions of the general tariff of the United States shall be applicable to articles imported from any foreign country, they shall be applicable to the products of such country, whether imported directly from the country of production or otherwise. To secure information to assist the President in the discharge of the duties imposed upon him by this section, and information which will be useful to Congress in tariff legislation and to the officers of the Government in the administration of the customs laws, the President is hereby authorized to employ such persons as may be required to make thorough investigations and examinations into the production, commerce and trade of the United States and foreign countries and all conditions affecting the same.

Proposed Tariff Commission.

It will be noted that, in the final clause of the section quoted, provision is made for a species of tariff commission to consist of experts who may be appointed from time to time by the President to gather information for the use of the Executive and for Congress. This provision is said to be acceptable as a compromise to those who have advocated the creation of a permanent tariff commission.

The revision of the customs administrative act of June 10, 1890, has been rendered necessary to expedite customs litigation and to make it practicable to secure harmonious decisions on appeals from the rulings of the Board of General Appraisers. Under existing practice it frequently happens that United States circuit courts of appeals in different jurisdictions render diverse opinions regarding similar controversies, as has recently been illustrated in the case of the dutiable classification of ferroalloys. The recurrence of such instance is rendered impossible by a provision of the bill creating a court of customs appeals, to which all cases arising before the Board of General Appraisers must be carried for decision on appeal. Another important reform which is sought to be effected is the prevention of the undervaluation of consigned goods, which it is estimated now costs the Government many million dollars annually.

The amendment to the Senate bill providing for the revision of the customs administrative act provides for the re-enactment of the entire law with the necessary changes incorporated therein. The law as amended is embraced in 30 sections, of which 28 are the original sections as amended, sections 29 and 30 being new provisions creating the court of customs appeals. The first four sections of the existing law are re-enacted with but slight verbal amendment. Section 5 is modified by the incorporation therein of a form of declaration to be made by consignees, importers or agents of merchandise actually purchased. The declaration authorized by the existing law as to goods actually purchased is required to be signed by the owner thereof, but cases frequently occur where it is necessary for the consignee, importer or agent to make the entry. The declaration prescribed in such cases is similar to that now made by owners of purchased goods.

Section 6 of the present law is re-enacted by the Senate amendment. Section 7 is modified by the Senate bill in several important particulars. In the first place, it is provided that the owner, consignee or agent of any imported merchandise may deduct from, as well as add to, an invoice to make market value where such value changed after the purchase of the goods and before their shipment to the United States. The present law permits additions only and often increases the already heavy losses of importers by compelling them to pay duties on the purchase price of goods which have declined before shipment. The second important provision in this section permits invoices of consigned goods to be increased or decreased to make market value, this change having been decided upon as but just to the owners of consigned goods who have prepared their invoices in good faith. The third amendment in this section prevents the assessment of penal duties on technicalities when "the amount of duty imposed by law on account of the appraised value does not exceed the amount of duty that would be imposed if the appraised value did not exceed the entered value." A strong effort was made to induce the Finance Committee to provide a margin of 5 or 10 per cent. within which undervaluations should not be penalized, but it was decided that any such margin would be availed of by unscrupulous importers systematically to understate the value of their invoices, as they would have everything to gain and nothing to lose thereby.

Market Value of Consigned Goods.

Sections 8, 9 and 10 of the present law are re-enacted without important change. Section 11, as framed by the

Senate, embodies some of the most important of the proposed changes, including a new definition of market value for consigned goods. The section as reported by the committee is as follows, the parts stricken from the present law being included in brackets, while new language is in italics:

Sec. 11. That when the actual market value, as defined by law, of any article of imported merchandise, wholly or partly manufactured and subject to an ad valorem duty, or to a duty based in whole or in part on value, cannot be [otherwise] ascertained to the satisfaction of the appraising officer, such officer shall use all available means in his power to ascertain the cost of production of such merchandise at the time of exportation to the United States, and at the place of manufacture, such cost of production to include the cost of materials and fabrication and all general expenses, *to be estimated at not less than* 10 *per centum*, covering each and every outlay of whatsoever nature incident to such production, together with the expense of preparing and putting up such merchandise ready for shipment, and an addition of not less than 8 nor more than 50 per centum upon the total cost as thus ascertained; and in no case shall such merchandise be appraised upon original appraisal or reappraisement at less than the total cost of production as then ascertained. [It shall be lawful for appraising officers in determining the dutiable value of such merchandise to take into consideration] *the actual market value or wholesale price, as defined by law, of any imported merchandise which is consigned for sale in the United States, or which is sold for exportation to the United States, and which is not actually sold or freely offered for sale in usual wholesale quantities in the open market of the country of exportation to all purchasers, shall not in any case be appraised at less than* the wholesale price at which such or similar *imported* merchandise is *actually* sold or *freely* offered for sale *in usual wholesale quantities* in the United States *in the open market*, due allowance *by deduction* being made for estimated duties thereon, cost of transportation, insurance and other necessary expenses from the place of shipment to the [United States] *place of delivery*, and a [reasonable] commission *not exceeding 6 per centum*, if any has been paid *or contracted to be paid* [not exceeding 6 per centum].

Sections 12 and 13 of the Senate measure substantially re-enact the provisions of the so-called general appraisers' act, passed by the last Congress.

Section 14 is amended so as to provide that appeals from the board shall be taken to the United States Court of Customs Appeals instead of to the United States Circuit Court. Sections 15, 16 and 17 contain no changes of importance, but section 18 has been carefully rewritten, and includes in the last clause a provision intended to apply to consigned goods as to which it may be alleged that no foreign market value therefor is ascertainable, the amendment authorizing the appraising officers to consider the actual market value or wholesale price of "similar merchandise comparable in value therewith." This section is as follows:

Sec. 18. That whenever imported merchandise is subject to an ad valorem rate of duty, or to a duty based upon or regulated in any manner by the value thereof, the duty shall be assessed upon the actual market value or wholesale price thereof, at the time of exportation to the United States, in the principal markets of the country from whence exported; that such actual market value is the price at which such merchandise is freely offered for sale to all purchasers in said markets, and is the price which the manufacturer or owner would have received, and was willing to receive, for such merchandise when sold in the ordinary course of trade in the usual wholesale quantities, including the value of all cartons, cases, crates, boxes, sacks, casks, barrels, hogsheads, bottles, jars, demijohns, carboys and other containers or coverings, whether holding liquids or solids, which are not otherwise specially subject to duty under any paragraph of the tariff act, and all other costs, charges and expenses incident to placing the merchandise in condition, packed ready for shipment to the United States, and if there be used for covering or holding imported merchandise, whether dutiable or free, any unusual article or form designed for use otherwise than in the bona fide transportation of such merchandise to the United States, additional duty shall be levied and collected upon such material or article at the rate to which the same would be subjected if separately imported. That the words "value," or "actual market value," or "wholesale price," whenever used in this act, or in any law relating to the appraisement of imported merchandise, shall be construed to be the actual market value or wholesale price of such, or similar merchandise comparable in value therewith, as defined in this act.

For a Customs Court of Appeals.

The remaining sections of the customs administrative act are amended in no salient particulars, but two new sections are added containing the most important feature of the amendatory measure and which creates a Customs Court of Appeals, to consist of a presiding judge and four associate judges appointed by the President, by and with the advice and consent of the Senate, each of whom shall receive a salary of $10,000 per annum. It is to be a court of record, with a marshal and a clerk, whose office shall be in the City of New York, and who shall perform and exercise the same duties and powers in regard to all matters within the jurisdiction of said court as are now exercised and performed by the clerk of the Supreme Court of the United States, so far as the same may be applicable. The salary of the clerk shall be $4000 per annum, which sum shall be in full payment for all services rendered by such clerk, and all fees of any kind whatever, and all costs, shall be by him turned into the United States Treasury. The court shall always be open for the transaction of business, and sessions thereof may be held annually, or oftener, in the several judicial circuits, at the following places: In the first circuit, in the city of Boston; in the second circuit, in the City of New York; in the third and fourth circuits, in the cities of Philadelphia and Baltimore; in the fifth circuit, in the cities of New Orleans and Galveston; in the sixth, seventh and eighth circuits, in the city of Chicago; in the ninth circuit, in the cities of Seattle, Portland and San Francisco, and in such other places in each of the above circuits as the court may from time to time designate. Any three of the members of the court shall constitute a quorum.

After the organization of this court no appeal shall be taken from any Board of United States General Appraisers to any other court, and no appellate jurisdiction shall be exercised or allowed by any other courts in cases decided by the Board of United States General Appraisers. The judgment or decrees of the Court of Customs Appeals shall be final in all such cases.

It is further provided that the President shall appoint "by and with the advice and consent of the Senate an Assistant Attorney-General, who shall exercise the functions of his office under the supervision and control of the Attorney-General of the United States, and who shall be paid a salary of $10,000 per annum; and there shall also be appointed by the Attorney-General of the United States a Deputy Assistant Attorney-General, who shall be paid a salary of $7500 per annum, and four attorneys, who shall be paid salaries, one of $6000 and the other three of $5000 per annum each. Said attorneys shall act under the immediate direction of said Assistant Attorney-General, or, in case of his absence or a vacancy in his office, under the direction of said Deputy Assistant Attorney-General; and said Assistant Attorney-General, Deputy Assistant Attorney-General and attorneys shall have charge of the interests of the Government in all matters of reappraisement and classification of imported goods and of all litigation incident thereto, and shall represent the Government in all the courts wherein the interests of the Government require such representation."

Bill to Be Pushed.

The consideration of the administrative features of the tariff bill will probably be deferred for 10 days or a fortnight. Owing to the desire of certain Senators to make extended speeches on the general features of the bill, little or no progress has been made in the consideration of the measure by paragraphs during the past week. It is believed, however, that general debate has now been exhausted, and, the Finance Committee in the meantime having had opportunity to adjust many minor controversies concerning the rates of the bill, rapid progress should hereafter be made.

W. L. C.

The Pittsburgh-Bartow Mining & Mfg. Company has been incorporated by Pittsburgh, Bridgeport and Wheeling interests with a capitalization of $125,000. George M. Koehnline, Bridgeport, Ohio, is president, and Walter Kennedy, Pittsburgh, consulting engineer. The ore property owned by the company in Bartow County, Ga., has been thoroughly investigated during the last few years, and the equipment of the property for the mining of ore is now under way. The railroad siding has been put in, loading and mining machinery are in place, and operations have been commenced for a large production of ore.

Blast Furnace Practice With All Magnetic Ore.

BY F. E. BACHMAN, PORT HENRY, N. Y.

It is generally believed that the manufacture of pig iron from magnetic ores requires an excessive amount of fuel and their use gives a never ending succession of furnace troubles, producing as a consequence an excessive proportion of off grade iron. The results of the use of an all magnetic ore charge in the Northern Iron Company's Port Henry furnace may be interesting.

The furnace is 69 ft. 3 in. high, with a 10-ft. hearth, 17-ft. bosh and 11-ft. stock line. It was built in 1873-1875. In 1902 boilers of 500 hp. and a 54 x 96 x 84 in. Morris engine, built in 1873, were added.. In 1905 three of the original stoves were replaced by three moved from a neighboring abandoned furnace. In 1907 the old boilers were replaced with new water tube boilers. The maximum blast pressure allowable is 12½ lb., owing to engine weakness. The maximum blast temperature is 950 degrees F., averaging 900 degrees. The results for three years are as follows:

1906.

Month.	Tons made.	Fuel. Pounds.	Ore. Pounds.	Stone. Pounds.	Ore. yield.	Per cent. stone to ore.
January	5,167	2.428	3,735	1,145	59.6	30.6
February	5,025	2,322	3,606	1,024	62.1	28.4
March	5,335	2,214	3,485	980	64.3	28.1
April	5,076	2,216	3.518	1,022	63.7	29.0
May	5,870	2,205	3,488	1,032	64.2	29.6
June	5,390	2,251	3,530	961	63.5	27.2
July	4,970	2,305	3,535	994	63.4	28.1
August	5,227	2,357	3,567	1,140	62.8	31.9
September	5,434	2,246	3,550	1,149	63.1	29.5
October	4,556	2,353	3,709	1,136	60.4	30.6
November	5,562	2,313	3,650	1,091	61.4	29.8
December	5,909	2,316	3,673	1,151	61.0	31.3
Year	63,521	2,291	3,586	1,036	62.46	28.8

Grade of Product.

	Foundry.	Gray forge.	Basic.	High sulphur.
Tons	508	8,451	53,670	892
Per cent. of total	0.80	13.30	84.50	1.40

Ore Used.

	Per cent.
Lump magnetic	12.8
Concentrates magnetic	87.2

1907.

Month.	Tons made.	Fuel. Pounds.	Ore. Pounds.	Stone. Pounds.	Ore. yield.	Per cent. stone to ore.
January	5,592	2,404	3,668	1,078	61.0	29.3
February	4,889	2,477	3,727	1,111	60.0	29.7
March	5,019	2.588	3,513	1,260	63.8	35.8
April*	2,900	2,461	3,320	1,082	67.2	32.6
July*	1,306	3,768	4,637	1,926	48.3	39.8
August	4,985	2,609	3,778	1,419	59.3	37.0
September	5,138	2,287	3,718	1,275	60.2	34.3
October	5,789	2,242	3,799	1,290	59.3	34.0
November	5,667	2,179	3,578	1,275	62.3	35.6
December	4,889	2,414	4,028	1,387	55.6	34.4
Year	46,174	2,437	3,785	1,267	59.2	33.5

Grade of Product.

	Basic.	Gray forge.	High sulphur.
Tons	37,420	8,565	185
Per cent.	81.04	18.55	0.41

* Furnace blown out for relining in April, blown in in July.

Ores Used.

	Per cent.
Lump magnetic	13.7
Concentrates magnetic	86.3

1908.

Month.	Tons made.	Fuel. Pounds.	Ore. Pounds.	Stone. Pounds.	Ore. yield.	Per cent. stone to ore.
January	6,052	2,161	3,648	1,159	61.4	31.8
February	5,358	2,304	3,909	1,074	57.4	27.5
March	5,618	2,234	3,697	1,063	60.6	28.8
April	5,301	2,201	3,724	978	60.2	26.2
May	5,555	2,281	3,729	1,037	60.1	27.8
June	4.337	2,300	3,705	1,097	60.5	32.3
July	5,568	2,240	3,750	1,042	59.7	27.8
August	5,142	2,327	3,850	1,211	58.2	31.4
September	5,634	2,116	3,460	1,056	64.7	30.5
October	5,002	2,338	3,869	1,183	58	30.5
November	5,410	2,187	3,457	1,093	65	31.6
December	5,530	2,240	3,640	1,079	62	30
Year	64.507	2,241	3,685	1,081	60.80	29.4

Grade of Product.

	Basic chills.	Gray forge and 3 foundry.	High sulphur.
Tons	14,520.02	49,895.53	91.45
Per cent.	22.50	77.35	0.15

Ores Used.

	Per cent.
Lump magnetic	8.50
Concentrates magnetic	91.50

No deductions were made for wastage. The yearly results are after adjusting to weights of ore, coke and stone paid for and pig iron shipped. High sulphur iron is iron containing over 0.05 per cent. sulphur. Iron remelted was deducted from the tonnage made when remelted.

The prejudice against magnetic ores probably arose from improper preparation of them for furnace use and comparing the results obtained with results from soft hematite mixtures yielding the same percentage of pig. A 6-in. cube of magnetite will be more likely to reach the hearth of a furnace partially reduced than a cube of hematite of the same size. If both ores are reduced to ¼-in. cubes the magnetite will reduce as readily as the hematite. The excess oxygen, combined and uncombined water in hematites, is replaced in magnetites by gangue. For this reason a 60 per cent. magnetite and a 50 per cent, soft hematite mixture requires the same amount of flux and produces the same amount of cinder per ton of iron produced. Comparisons should be made on the basis of heat requirements and the work done per ton of pig made.

Smelting Titaniferous Magnetites.

The time cannot be far distant when Eastern furnaces will depend on the enormous Adirondack deposits of titaniferous magnetites for their base ore supply. Careful investigation and tests have demonstrated that the Tahawus ores will concentrate to a 58 to 60 per cent. ore with less than 0.01 per cent. phosphorus, appreciable amounts of vanadium and nickel, and not to exceed 6 per cent. of titanium. The Tahawus deposit has ore enough to produce 1,000,000 tons of such concentrates per year for a century, which with railroad connections it can deliver at Eastern furnaces for but little more than one-half the present price of lake ores. Tae concentrates produced are somewhat coarser than the Mineville product.

A furnace test made on 700 tons of crude Tahawus ore, running 50 per cent. iron and 20 per cent. TiO_2, which ore was wagoned 50 miles to a railroad, was so satisfactory that the company testing it entered into a long term contract for concentrates beginning when railroad facilities are had. A second furnace manager who used several thousand tons of titaniferous magnetites reports that they worked like any other ore, causing absolutely no trouble. A furnace in this neighborhood used for some time an ore containing 50 per cent. iron and 15 per cent. TiO_2 at the end of the blast and blew out clean. The writer 20 years ago used several hundred tons of 50 per cent. ore containing 13.5 TiO_2 with no bad results. These are the only tests on these ores with coke fuel in furnaces having firebrick stoves under anything approaching modern conditions of which the writer can get any record.

Within a year the writer examined a charcoal stack abandoned in 1854, after completing an 18 months' campaign on ores containing 48 to 50 per cent. iron and 20 to 22 per cent. TiO_2. Its lining is still intact. The writer never saw as clean a blowout. The furnace certainly was not scaffolded when blown out and looks as if it never had been. There is no salamander in the hearth or on the dump. The length of blast was phenomenal for any furnace at that time and proves that the ores can be successfully smelted. The cinder looks to have been more fluid than an average good charcoal cinder and almost as fluid as coke slag. It was noticed that, although very acid, containing silica, 25.18 per cent.; TiO_2, 28.74 per cent.; alumina, 11.79 per cent.; CaO, 24.32 per cent.; magnesia, 5.97 per cent.; FeO, 3.12 per cent.; alkalies, 1.21 per cent., it has somewhat the appearance of anthracite slag high in lime. The product of this furnace was wagoned 50 miles to Lake Champlain and then boated 250 miles to a market.

The cause of failure to smelt titaniferous ores success-

fully in the small, shallow and narrow hearthed furnaces of 50 years ago with 500 to 600 degrees heat, 2 or 3 lb. engines and not enough blast to keep the fire burning, can readily be understood if we remember that a 40 per cent. titaniferous looks to be as rich as a 60 per cent non-titaniferous magnetite. Such magnetites are generally harder to break and, therefore, likely to have been charged into furnaces in larger lumps instead of very fine, as they should have been. The founder whose only analysis was by weight and appearance, thinking them rich when they were lean, started with about one-half the lime necessary to flux them properly. When he saw the cinder he was again deceived and took off the lime instead of adding it. The fracture of the charcoal slag referred to would have made an anthracite founder of the old days wild with fear of a "lime set." The results from his lack of knowledge were inevitably sticky furnaces, slips, chilled hearths and salamanders, due not to titanium but to improper fluxing and poor furnace equipment.

United Metal Trades Association of the Pacific Coast.

The third annual convention of the United Metal Trades Association of the Pacific Coast was held at the Chamber of Commerce Auditorium, Seattle, Wash., April 24. The officers elected for the ensuing year are the following: President, O. E. Heintz, Pacific Iron Works, Portland, Ore.; secretary-treasurer, A. Smith, Smith & Watson Iron Works, Portland; first vice-president, Gilbert Hunt, Gilbert Hunt Company, Walla Walla, Wash.; second vice-president, Geo. James, Variety Iron Works, Seattle, Wash.; third vice-president, Niven McConnell, McConnell Engineering & Machinery Company, Tacoma, Wash. The election of a commissioner is in the hands of the Executive Council. The incumbent is Herman S. Hastings.

In his report the commissioner reviewed the work of the association in the past year, which has been unusually free from strikes. In February, 1909, the molders' strike was called off by the local unions. Many union molders have since applied for work at the different shops and at the association's office, but so far none of these have been taken on. The shops are now running with working forces equal to their requirements. Reference was made to the fact that the International Association of Machinists now has three organizers at work on the Pacific Coast. The efforts of the officers of the United Metal Trades Association in the matters of the tariff on iron and steel products and of freight rates to the coast on pig iron, structural steel and other products bought in the East by coast manufacturers were described in detail. The freight rate on pig iron to the coast from points east of the Mississippi River has recently been reduced from $13.20 a ton to $10. The commissioner told how the association had used its influence at Washington in favor of free iron ore and low duties on pig iron and scrap. On the other hand, it had urged that the duty on pipe be not reduced to such an extent as to prevent pipe manufacture by the Oregon Iron & Steel Company. Through the efforts of the association a metal trades exhibit will be a feature of the Alaska-Yukon-Pacific Exposition. A building, 80 x 200 ft., will contain a machine shop, pattern shop, forge and foundry, representing these industries as developed in the Northwest.

The Oregon members have interested themselves in a trade school operated in connection with the University of Washington at Seattle. This school has made progress in the year and a number of boys have been given instruction in drafting, in machine shop, forge and foundry work, core making and pattern making. Another institution, in view of the progress made, has asked the association to co-operate in promoting a second trade school.

Referring to the Employers' Association of Oregon, organized at Portland in January, the report spoke of the advisability of having the various employers' associations working in closer co-operation. None of the trades in the various communities of Washington and Oregon is strong enough to support an employers' association office of its own, but working on the co-operative basis these associations could be unified and strengthened. At Spokane, following a strike in the sheet metal working trade, the open shop has been maintained. There are also open shop plumbing establishments, but most of the building trades are union. In the year, it was stated, considerable was accomplished by the association in fostering open shop sentiment, reference being made in this connection to the meetings held in March at various points, addressed by President F. K. Copeland of the National Metal Trades Association. Special emphasis was laid by the commissioner on the importance of all members breaking in new workmen.

A number of addresses were made at the convention. J. H. Linton, Vilter Mfg. Company, Milwaukee, secretary of the American Chemical Society, presented a paper on "Chemistry as Applied to Foundry Practice." Prof. E. O. Eastwood of the department of engineering, University of Washington, described the work carried on in that department in the establishment of a trade school. Mr. Woodcock and Dr. Kilbourne of the Seattle Young Men's Christian Association described the plans for a trade school in connection with that organization. Frank Hanford, representing the Pennsylvania Casualty Company, spoke on "Industrial Insurance."

Cincinnati's Farewell to Commissioner Wuest.

The formal closing of the office of the National Metal Trades Association in Cincinnati, preparatory to removal to Cleveland, was marked with some important farewell functions with Commissioner Robert Wuest as the central figure. The most important of these was the complimentary dinner given by the Stemwinders of the Business Men's Club on the evening of April 29. Mr. Wuest is a Stemwinder of long standing, and according to his fellow members "the roaster chief" of the organization. With a most pleasing menu, a profusion of flowers and some of the most inspiring after dinner talks ever heard in the club, the event will be long remembered by the 50 participants, among whom were a number of machine tool manufacturers.

W. F. Robertson, Robertson Iron & Steel Company, was the toastmaster, and a fine one. Dr. J. M. Withrow, who has led the fight for the small school board to regulate internal educational affairs, talked about the progress of that measure, and paid a tribute to the Metal Trades Association for its work in the interests of co-operative education and particularly the members of the Cincinnati branch. He announced that, with no ill-luck in the meantime, the first forge shop in Cincinnati public schools would be in operation on the first of the year.

A. G. Brunsman, a prominent local vehicle manufacturer, who is also a song composer and vocalist, lauded the retiring commissioner in all these qualifications. Fred Geier, an officer in the National Association, outlined some of the fine working points of the organization in the harmonizing of labor and capital, not forgetting to cede a goodly measure of praise to Mr. Wuest. J. F. Doering, a veteran Stemwinder, paid his tribute in humorous verse. B. B. Quillen, Cincinnati Planer Company, and also now a member of the National Administrative Council, gave a witty delineation of the honored guest's character, winding up with the reading of a somewhat questionable letter of recommendation which he offered the commissioner to present on his arrival in Cleveland. W. T. Johnston, apparently the technical representative of the Stemwinders, gave a forceful definition of the meaning of that term, in which there was opportunity for a variety of covert hits, not forgetting the departing member. Benjamin Sebastian, Sebastian Lathe Company, paid his tribute in eloquent words. Henry Dreses, Dreses Machine Tool Company, in a very humorous delineation of his woes as a bachelor, did not omit to note that Mr. Wuest had been trying for nine years to get him a wife, without success. President C. H. M. Atkins, Warner Elevator Company, and president of the Business Men's Club, an enthusiastic Stemwinder, predicted that the departing commissioner would be back at the old stand within a year or so.

H. T. Atkins, president Pearce & Atkins Company;

George Puchta, Queen City Supply Company, and Assistant Secretary J. M. Manley of the Cincinnati branch, all paid glowing tributes to the worth and good fellowship of Commissioner Wuest, Mr. Manley's tribute being directed especially to Mr. Wuest. The peroration of the evening, however, and one of the choicest oratorical and literary efforts ever heard in Cincinnati, was delivered by James F. Taylor, one of the officials of the American Oak Leather Company, in the tribute of the manufacturing and commercial interests and the presentation of a silver loving cup from the Stemwinders' organization. The humor of the early evening was furnished by Frank M. Snook, general manager of the Dana Mfg. Company, who was made up in perfect form to represent "old man Grump," a character made famous locally in baseball circles by Cartoonist Schaefer of the *Enquirer*. At frequent intervals the guests essayed songs with more or less musical effect to the tune of favorite airs.

The Mechanical Engineers.

WASHINGTON, D. C., May 5, 1909.—(*By Telegraph.*)—The spring meeting of the American Society of Mechanical Engineers opened Tuesday evening in the New Willard Hotel, where the society has its headquarters, with the reception by the officers, which usually comes on the closing night of the convention. Following this, D. S. Carll, as chairman of the local committee and the Committee of the Washington Society of Engineers, welcomed the visitors, and for the more formal welcome by the city introduced B. F. McFarland, president of the Board of District Commissioners. Mr. McFarland's address was mainly a testimonial to the engineers who have been responsible for the layout of the national capital and its water, sewerage and traction service. President Jesse M. Smith of the society responded briefly with assurances of the society's appreciation of the elaborate provisions made for its entertainment. Dancing to music by the Marine Band occupied the remainder of the evening.

The Joint Conventions of the Supply and Manufacturers' Associations.

This week and next the American Supply and Machinery Manufacturers' Association is to meet with the Southern and National Supply and Machinery Dealers' associations, and it is expected that there will be a large attendance of members of the manufacturers' association at both conventions. At the joint convention of the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, which opened May 5 at the Hotel Patten, Chattanooga, Tenn., and which will be in session three days, among the principal issues that will be brought up will be the establishment of the proper resale prices on wrought iron pipe and leather belting. As all the jobbers and manufacturers are much interested in placing these two commodities on a profitable basis, it is hoped to bring about a satisfactory settlement at this convention.

The programme of the convention provides for separate executive sessions, open to members only of the Supply and Machinery Dealers' Association, to be held Wednesday morning, at which reports of the officers and committees were to be presented, and in the afternoon a joint session at which the presidents of the two associations were to make addresses and papers read by a member of each association upon "Practical Plans for Putting Into Operation and Establishing a Proper Resale Policy." The Thursday morning programme provides for an address by F. A. Hall, Yale & Towne Mfg. Company, New York, on the "Necessary Steps to Secure the Co-operation of Manufacturers Who Are Outside of the Supply and Machinery Manufacturers' Association"; J. A. Reichman, Reichman-Crosby Company, Memphis, Tenn., "Necessary Steps to Secure Co-operation of Dealers Who Are Outside of the Southern Supply and Machinery Dealers' Association"; George W. Taite, Sakyer Belting Company, Cleveland, Ohio, "How Can Traveling Salesmen Be Boosters for Association Work"; W. H. Banks, Banks Supply Company, Huntington, W. Va., the "Duty of the Jobber to Give Effective Representation to the Manufacturer." Thursday afternoon executive sessions of the two associations will be held, at which will be received reports of the committees followed by discussions. Separate executive sessions, open to members only of the Dealers' Association, will be held Friday morning, at which new officers will be elected, and in the afternoon a joint executive session will be held at which the report of the Manufacturers and Conference Committee will be presented.

The entertainment features are luncheons for the ladies, smoker and vaudeville performance, banquet, an automobile ride for the ladies to Chickamauga Park and a boat ride down the river to the lock and dam.

The programme of the fourth annual meeting of the National Supply and Machinery Dealers' Association, in joint convention with the American Supply and Manufacturers' Association, to be held at the Fort Pitt Hotel, Pittsburgh, Pa., May 12, 13 and 14, is as follows: Wednesday morning each association will hold executive sessions, open to members only, at which reports will be received from the officers. The afternoon session of the National Supply and Machinery Dealers' Association will be devoted exclusively to the consideration of machinery subjects, including contracts for the sale of machinery and the observance of territorial rights thereunder, large commissions and resale prices on certain classes of machine tools, and the National Machine Tool Builders' Association, a factor in maintaining prices and its value to machine tool dealers. At the meeting of the manufacturers an address will be made on the "Benefits of Members in the American Supply and Machinery Manufacturers' Association," by E. H. Hargrave of the Cincinnati Tool Company, Cincinnati, Ohio, and "Why Every Prominent Manufacturer of Supplies and Machinery Should Be Enrolled in Its Membership," by D. K. Swartwout of the Ohio Blower Company, Cleveland, Ohio. Thursday morning joint executive sessions of the two associations will be held, and addresses will be made on "The Necessity for Clearly Defining Trade Policies Among Manufacturers and the Dealers and the Best Methods of Obtaining Results," by F. A. Hall of the Yale & Towne Mfg. Company, New York; "The Value of Association Work in Promoting and Advancing the Interests of Manufacturers and Consumers," by W. E. Frick of the Frick & Lindsey Company, Pittsburgh, Pa., both of which will be followed by general discussions. Thursday afternoon executive sessions of each association will be held and several important topics discussed. Friday morning executive sessions will be held, and in the afternoon joint sessions of the two associations, when the newly elected officers will be installed. Quite an elaborate programme for entertaining the members and the ladies has been arranged.

An Anthracite Agreement for Three Years More.—A tri-district convention of the United Mine Workers of America, held at Scranton, Pa., April 28, sanctioned the proposed agreement between the anthracite operators and miners. Later the operators and representatives of the miners held a meeting in Philadelphia and signed the agreement. Its principal features are the following: Renewal of the award of the Anthracite Strike Commission for three years. Wages for new work to be fixed by the Conciliation Board where the men and company cannot agree and the rate to be not less than that for old work of similar character. Union men allowed to appeal to the Conciliation Board for an investigation of dismissal where it is believed to be because of membership or activity in the union. Individuals or bodies of men allowed to take up grievances direct with mine officers, using the Conciliation Board only as a last resort. Union officers allowed to collect dues at the offices of the companies on pay day, also to post notices. Companies to use a uniform pay statement bearing the name of the colliery, class of work performed, name of employee and amount of wages due.

Pig Iron Production.

Further Curtailment in April.

Yet Active Capacity May 1 Was Greater Than on April 1.

April, a short month, showed about 100,000 tons smaller pig iron production than March, the figures for coke and anthracite furnaces being 1,738,877 gross tons and 1,836,194 tons, respectively. The daily rate of production in April was 57,962 tons, against 59,232 tons in March. Yet the weekly capacity active on May 1 was about 4500 tons (representing about 640 tons a day) more than on April 1, the figures being 413,710 tons and 409,217 tons, respectively. The explanation appears to be that the furnaces blown in in April were of greater average capacity than those blowing out, the large steel company stocks showing a net gain of four in the month, while the considerably smaller merchant stacks showed a net loss of six. The indications are, therefore, that the steel company blast furnaces will show an increasing output in May. The number of coke and anthracite furnaces active on May 1 was 223, against 225 one month previous. The Steel Corporation made a net gain of two active furnaces in the month, and the independent steel companies the same number.

Daily Rate of Production.

The daily rate of production of coke and anthracite pig iron by months, beginning with January, 1908, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
January, 1908	21,432	12,286	33,718
February	25,717	11,446	37,163
March	27,145	12,474	39,619
April	24,185	14,104	38,289
May	24,505	13,098	37,603
June	23,923	12,521	36,444
July	25,762	13,525	39,287
August	28,952	14,899	43,851
September	31,117	16,183	47,300
October	32,217	18,337	50,554
November	32,705	19,890	52,595
December	35,172	20,986	56,158
January, 1909	35,983	21,992	57,975
February	38,367	22,609	60,976
March	36,811	22,421	59,232
April	36,436	21,526	57,962

The number of active furnaces of the United States Steel Corporation and of the independent steel companies at the beginning of each month since January appears below:

	Steel Corporation.	Independent steel companies.
Furnaces in blast February 1	62	49
Furnaces in blast March 1	65	45
Furnaces in blast April 1	66	39
Furnaces in blast May 1	68	41

Production of Steel Companies.

Returns from all plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland, Colorado and Tennessee (Ensley) companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1907.	1908.	1909.	1908.	1909.
January	1,406,397	664,415	1,117,823	20,254	12,325
February	1,317,923	745,802	1,073,363	9,402	10,046
March	1,424,827	841,502	1,140,553	13,750	23,743
April	1,446,788	725,548	1,093,092	12,363	22,478
May	1,470,080	759,674	.....	17,823	....
June	1,457,230	717,689	.....	15,958	....
July	1,452,557	798,639	.....	10,250	....
August	1,445,685	897,052	.....	14,932	....
September	1,417,153	933,514	.....	8,938	....
October	1,514,521	996,481	.....	12,174	....
November	1,084,114	981,167	.....	15,882	....
December	659,459	1,090,339	.....	6,510	....

April Product by Districts.

The table below gives the production of coke and anthracite furnaces in March and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	December. (31 days)	January. (31 days)	February. (28 days)	March. (31 days)	April. (30 days)
New York	138,445	128,773	110,392	117,219	91,283
New Jersey	18,680	21,144	19,518	19,577	19,798
Lehigh Valley	52,172	53,144	50,762	49,072	46,463
Schuylkill Val.	47,237	56,449	51,447	58,169	54,004
Lower Susquehanna and Lebanon Val.	38,190	49,691	49,379	45,150	45,973
Pittsburgh Dis.	410,887	416,643	388,031	407,148	403,981
Shenango Val.	103,549	94,741	84,609	85,321	77,434
West. Penn	99,520	107,060	116,711	139,873	129,543
Md., Va. and Kentucky	53,369	56,464	52,257	56,402	63,311
Wheeling Dis.	39,317	54,176	53,735	58,156	46,696
Mahoning Val.	152,599	158,407	141,405	160,357	171,107
Central and North. Ohio.	132,590	129,174	124,650	126,719	119,226
Hocking Valley, Hanging Rock and S. W. Ohio	41,626	44,410	42,772	48,521	43,841
Mich., Minn., Mo., Wis., Colo	63,839	67,830	60,512	72,481	55,995
Chicago Dist.	169,085	177,663	196,061	219,009	211,776
Alabama	148,611	149,280	135,374	143,407	136,909
Tennessee, Georgia and Texas	31,196	32,511	29,725	29,613	21,537
Totals	1,740,912	1,797,560	1,707,340	1,836,194	1,738,877

Among furnaces blown in in April were one Lackawanna in New York, one Bethlehem in the Lehigh Valley, one Shenango in the Shenango Valley, Perry in western Pennsylvania, Buena Vista in Virginia, Hannah and one Haselton in the Mahoning Valley, and one Union and two South Chicago in the Chicago District. The list of furnaces blown out includes one Colorado Fuel & Iron in Colorado, Bellefonte, Saxton and Marshall in western Pennsylvania, Lebanon Valley in Pennsylvania, one Lucy and Clinton in the Pittsburgh District, West End in Virginia, Madeline of the Inland Steel Company in the Chicago District, Citico and one Rockwood in Tennessee, and Rome in Georgia.

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	May 1. Number in blast.	May 1. Capacity per week.	April 1. Number in blast.	April 1. Capacity per week.
New York:					
Buffalo	15	9	20,547	8	17,042
Other New York	7	3	3,719	3	3,877
New Jersey	8	3	4,619	3	4,421
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	12	11,168	11	10,283
Spiegel	3	2	810	2	791
Schuylkill Valley	15	8	12,602	8	12,305
Low. Susquehanna	7	3	4,033	3	3,894
Spiegel	1	1	578	1	558
Lebanon Valley	10	5	5,702	6	5,835
Pittsburgh Dist.	45	33	90,458	35	94,482
Spiegel	3	3	2,961	3	2,857
Shenango Valley	20	9	18,980	8	18,837
West. Penn	27	17	30,366	19	30,597
Maryland	4	2	4,768	2	4,424
Wheeling Dis.	14	4	10,964	4	11,710
Ohio:					
Mahoning Valley	20	16	40,582	14	37,709
Central and Northern and Michigan	22	13	30,217	13	30,999
Hocking Val., Hanging Rock and S. W. Ohio.	15	12	10,228	12	10,974
Illinois and Indiana	27	20	52,419	18	46,747
Spiegel	2	1	895	1	1,162
Minnesota and Wis.	7	4	5,487	4	5,427
Missouri and Colorado	7	3	5,262	4	8,036
The South:					
Virginia	23	10	7,931	10	7,161
Kentucky	5	2	2,036	2	1,896
Alabama	46	22	31,945	22	31,015
Tennessee	18	6	4,433	8	5,798
Georgia and Texas	3	0	0	1	380
Totals	401	223	413,710	225	409,217

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1906, the figures representing gross tons:

	Capacity per week.		Capacity per week.
May 1	413,710	August 1	513,471
April 1	409,217	July 1	528,170
March 1	420,807	June 1	523,220
February 1	414,497	May 1	524,538
January 1, 1909	401,994	April 1	496,456
December 1, 1908	381,102	March 1	511,035
November 1	362,685	February 1	492,359
October 1	337,925	January 1, 1907	507,397
September 1	313,112	December 1, 1906	513,860
August 1	284,590	November 1	500,580
July 1	264,452	October 1	469,665
June 1	259,284	September 1	441,426
May 1	268,674	August 1	449,908
April 1	264,890	July 1	460,570
March 1	267,437	June 1	472,622
February 1	241,925	May 1	484,031
January 1, 1908	235,152	April 1	484,240
December 1, 1907	347,372	March 1	479,737
November 1	491,436	February 1	482,156
October 1	511,397	January 1, 1906	463,673
September 1	507,768		

The Curve of Pig Iron Production.

In the diagram below the fluctuations in the average daily rate of pig iron production by months is shown for the past 28 months. It will be seen that the April decline was about equal to that in March:

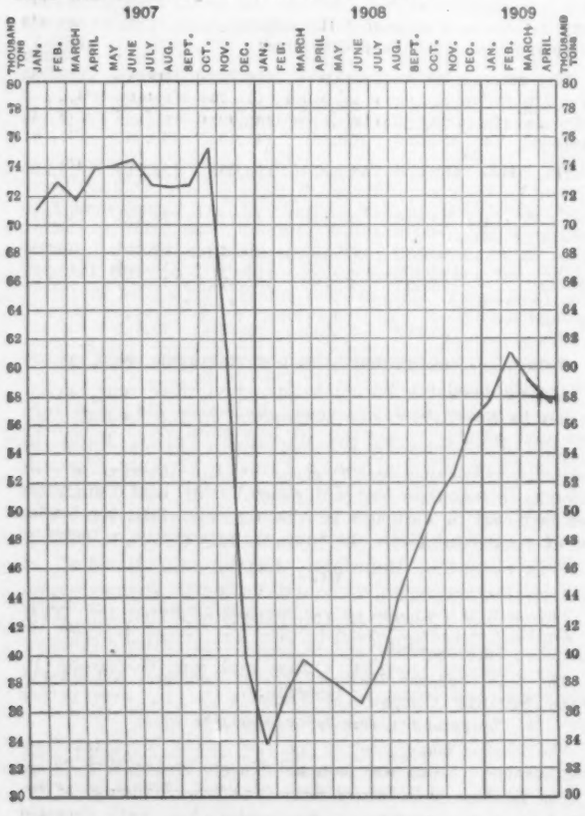


Diagram of Average Daily Production of Coke and Anthracite Pig Iron by Months Since January 1, 1907.

NEWS OF THE WORKS.

Iron and Steel.

The Lackawanna Steel Company now has three furnaces in blast at South Buffalo, N. Y., one having been blown in in April.

The Bethlehem Steel Company has four furnaces in blast at South Bethlehem, Pa. Furnace E, which had been out for relining, was blown in April 18.

The Struthers Furnace Company blew out its furnace at Struthers, Ohio, this week. It is expected that work will soon begin on a new furnace to take its place.

The Republic Iron & Steel Company had four of its Northern furnaces in blast May 1, one Hannah and one Haselton having been blown in in April. All three furnaces of the Pioneer group, Thomas, Ala., are in blast.

General Machinery.

The Connellsville Iron Works, Connellsville, Pa., which recently completed some improvements to its plant and increased its capital from $10,000 to $50,000, reports business as good. A recent contract includes a complete stone crushing plant, consisting of crusher, elevator, screens, large capacity narrow gauge steel cars, &c., for the Monongahela Stone, Clay & Brick Company at Cool Spring, near Uniontown, Pa. The latter has its quarries inland and has to haul its material 2 miles to the railroad at Lemont, Pa.

The Carlin Machinery & Supply Company, N. S., Pittsburgh, has been appointed agent in the Pittsburgh District for the sale of the Marsh concrete mixers made by the Marsh Company, Old Colony Building, Chicago. The company has shipped to the Olds Gas Power Company, Lansing, Mich., a derrick hoist, which the latter will fit with one of its gas engines and send to a contracting firm for erecting purposes. The Carlin Company manufactures a line of single and double drum hoists which it sells to various engine manufacturers who equip them with their own make of engines on specifications from customers.

The Pittsburgh Gage & Supply Company, Pittsburgh, has received a contract from the Berwind-White Coal Mining Company, Windber, Pa., for a Smith-Bailey triplex 5 x 8 in. mine pump; Princeton Power Company, Princeton, W. Va., 16-in. deep well pump, and an order for a large lot of fittings and small pipe for the Peters Packing Company, McKeesport, Pa.

The Union Tool Company, Los Angeles, Cal., which operates at the place a plant for the manufacture of oil well machinery and supplies, is preparing to build new shops in the Fullerton oil fields, near Randolph, Cal., to cost about $50,000. The object of this plant will be to manufacture oil well tools adapted to the use in the particular field in which the shop is located. Other shops are now being erected in the Midway and Coalinga fields.

H. E. & O. S. Lundgren, Fort Cook, Neb., will begin the construction of a new machine shop about July 1, which will be equipped with one 20 in. by 8 ft. lathe, a 5-ft. planer, one 12 and one 24 in. drill.

The Vulcan Iron Works, Mason City, Iowa, maker of blacksmith tools and machines, is building a two-story machine shop, 32 x 62 ft., to provide room for the manufacture of a newly patented steam and hot water boiler which it is putting on the market. The boiler, which is of the cast iron sectional type, is provided with a mechanical cleaning device operated from the outside, by which soot is removed from the heating surface.

The Valley City Machine Works, Grand Rapids, Mich., is planning a two-story brick addition, 33 x 50 ft., to its plant. To the line of woodworking and grinding machinery now made will be added the manufacture of a water motor for washing machines.

The plant and machinery of the Bullard Automatic Wrench Company, East Providence, R. I., will be sold at auction May 12. There are two brick buildings, 35 x 95 ft. and 42 x 51 ft., respectively, on a site of two acres, which are equipped with up to date machines.

Hugh McPherson and F. Waterbury are opening a new garage and machine shop for automobile repair work at 66 Peru street, Plattsburgh, N. Y. Mr. Waterbury, who was formerly in the employ of the Lozier Motor Car Company, will have charge of the machine shop repair work.

F. H. Wilbur & Son, Lestershire, N. Y., are about ready to start construction on an addition to their automobile garage building, in connection with which an up to date machine and repair shop will be maintained. The equipment for the shop will include one 50-hp. engine, lathes, derrick, polishing and grinding machinery and other small tools required for automobile repair work.

The Papec Machine Company, Lima, N. Y., and the Boutell Mfg. Company, Rochester, N. Y., have purchased the Empire Drill Company's plant at Shortsville, recently occupied by the Empire division of the American Seeding Machine Company, which moved to Richmond, Ind. The Papec Company manufactures ensilage cutters and also does a job molding and foundry business, and the Boutell Company manufactures apple slicers, apple parers and all kinds of machinery used in evaporators. It is said that the latter manufactures four-fifths of the evaporating machinery used in this country. The two companies are allied in a business way, owing to the same directors in each. The present machinery at Rochester and also at Lima will be moved to the new plant and considerable new machinery will also be added.

The St. Lawrence Division of the New York Central & Hudson River Railroad is having plans prepared and will soon call for bids on construction of a 25-stall roundhouse, of brick and steel construction, to be erected at Norwood, N. Y.

Contracts have been let and work started upon the construction of a new brick factory building, 82 x 132 ft., for the Wood Electric & Mfg. Company, South Bend, Ind. This plant will be run in conjunction with the one now operated by the company at 114 East Sample street, and is intended to be ready for operation by June 1. It will be devoted to the manufacture of the Wemco gasoline engine, made in two sizes of four and six cylinders, the particular feature of which is an unusually large valve by the use of which the speed of the engine is said to be greatly increased.

The plant of the Temple Iron Works, Temple, Texas, whose repair shop was recently destroyed by fire, will be rebuilt, the new buildings to include a machine shop, 24 x 60 ft., and repair shop, 20 x 30 ft. It is expected that the new buildings will be ready for operation in about four weeks. No new machinery will be required.

Recent sales of the Crocker-Wheeler Company, Ampere, N. J., include Spanish-American Iron Company, Felton, Nipe Bay, Cuba, 230-volt direct current motors aggregating 235 hp.; Morgan Engineering Company, Alliance, Ohio, 135 hp. of direct current motors; International Silver Company, Meriden, Conn., six motors, aggregating 131 hp.; Perry Fay Mfg. Company, Elyria, Ohio, 300 kw. of direct current generators. The company also sold many smaller generators and motors ranging in size from 35 to 100 kw.

The Kansas City, Mexico & Orient Railroad, Kansas City, Mo., contemplates the erection of shops at Wichita, Kan., for which that city has voted $150,000 in bonds.

The Goldsboro Traction Company, Goldsboro, N. C., will erect a repair shop at East Goldsboro. The company owns franchises covering the main streets in Goldsboro and has at present under construction 2½ miles of track, running from the Union Passenger Station to the western side of the city to East Goldsboro, a suburb, and to Reville Park, which is owned by the company and which will be made an up to date amusement park. It is hoped to have cars in operation within 60 days, using electric power. The company has under consideration an exten-

sion of 15 miles to Seven Springs, N. C., but it has not yet decided just when work on this line will be commenced. All material for work now under construction has been contracted for except the cars. E. T. Oliver is manager.

The Menominee Iron Works, Menominee, Wis., is considering a proposition for the removal of its plant to Bemidji, Minn.

It is stated that E. E. Grossett, master mechanic of the Iowa Central Railway at Marshalltown, Iowa, has prepared plans for new machine shops which are awaiting the approval of the management.

Foundries.

The Sharon Foundry Company, Sharon, Pa., manufacturer of steel castings, is installing tanks, piping equipment and burners in its furnace department, as oil fuel will hereafter be used in place of gas. It expects the change to effect a saving in fuel and increase its output from 700 to 900 tons of steel castings per month.

It is thought that the Central Foundry Company has established a new speed record in the rebuilding of its plant at Anniston, Ala., which was recently destroyed by fire. The date set for resuming the manufacture of pipe at the plant, May 3, is just three weeks from the day that the first timbers of the reconstructed plant were raised, and since that time a main foundry building, 120 x 500 ft.; cleaning room, 46 x 90 ft., and a cupola house, 60 x 85 ft., have been erected. A large force of men was engaged in the work of installing the machinery.

Additions to the plant of the Bowmanville Foundry Company, Bowmanville, Ont., Canada, costing $4000, are to be made the coming summer. These include two buildings, one to be used as a plating and milling room, the other, a two-story cement structure, to be utilized as a pattern storehouse.

The Michigan Brass & Iron Works, Lansing, Mich., successor to the Walker & Schultz Foundry Company, has been capitalized at $20,000 The company will erect a new foundry south of the old one on Cedar street, North, for the manufacture of gray iron, brass, bronze and aluminum castings. Work on the new foundry will be begun at once and hurried to completion. The officers are Wm. Walker, president; Clifford K. Gleason, vice-president and treasurer, and Edward V. Prentice, secretary.

The business founded by Brokelmeyer & Willig in 1898 at Temple, Texas, and changed to Brokelmeyer & Bracken in 1906, has been incorporated as the Temple Foundry & Machine Company, with a capital stock of $10,000. In addition to general foundry and machine work, the company carries on a structural iron business. H. Brokelmeyer is president; Edward Winston, vice-president, and B. L. Gilliam, secretary and treasurer.

Willard A. Van Brunt, Horicon, Wis., is considering the erection of a foundry to make agricultural implement castings and possibly for custom work.

The Western Crucible Steel Castings Company, Minneapolis, Minn., will begin the construction shortly of an extension to its works.

The foundry of the late William Mann in Martins Ferry, Ohio, has been purchased by James H. Beans, who has placed it in operation.

Power Plant Equipment.

The installation of a new electric light plant at Iowa City, Iowa, is contemplated by Frank Benjamin, who recently secured a franchise for that purpose.

Active preparations are being made by the Utah County Light & Power Company, Salt Lake City, Utah, for the installation of a new plant in Alpine Canyon.

The Sharon Boiler Works, Sharon, Pa., has received an order for a 400-hp. Wheeler water tube boiler from the Stewart Iron Company, Sharon, Pa. The latter has been making improvements to its blast furnace, ore bins, &c.

The city of Rushville, Ind., will receive bids until May 14 for an engine, piping, alternating current generator and exciter for the city lighting plant. S. G. Gregg is city clerk.

The Detroit River Tunnel Company has let general contract to the Butler Bros.-Hoff Company, Detroit, Mich., for the construction of a substation and battery building, 50 x 207 ft., to be built on the Detroit River, foot of Eleventh street, to cost $100,000.

The Cloos Engineering Company, Milwaukee, has prepared plans for a pumping station and electric light plant which the city of Sparta, Wis., contemplates erecting either as a unit or in separate stations.

The Detroit Water Board, H. S. Starkey, general manager, Detroit, Mich., is having plans prepared for a new pumping station, 342 x 436 ft., of reinforced concrete, brick and structural steel, to be built at Water Works Park, at a cost of $800,000. Bids will be called for early in June.

Bridges and Buildings.

The Scully Steel & Iron Company, Chicago, Ill., with Eastern offices at 2 Rector street, New York, has opened a large warehouse at Mallory avenue and Fisk street, Jersey City, where the company has acquired an Eastern plant on about 30 acres of property. The warehouse is near the Westside avenue station of the Central Railroad of New Jersey and a branch of that road extends into the company's property. In addition to manufacturing some boiler specialties at the plant, the company will carry in its warehouses a full stock of boiler makers' and iron workers' supplies, including boiler braces, boiler flanges, pressed steel boiler nozzles, pressed steel boiler lugs, pressed steel crabs, staybolts, patch bolts, tube expanders, flue cutters, flue cleaners, &c. The establishment of the Eastern warehouse has resulted from a continuous demand for boiler and structural shop equipment from that territory, and in the future the company will be able to supply the Eastern trade with immediate shipments from its Jersey City stock.

The erection of a three-story reinforced concrete building, 83 x 210 ft., in Minneapolis, Minn., for the accommodations of light manufacturing plants, is contemplated by L. P. & F. B. Chute.

The Lackawanna Bridge Company, recently incorporated at Buffalo, N. Y., has purchased 15 acres of land between Abbey street and the South Buffalo Railroad, the Lackawanna Steel Company's industrial line, and adjacent to the latter company's works, on which it will erect an extensive plant for the fabrication of steel. It is hoped the new plant will be ready for operation December 1. The site was chosen with a view to procuring material from the Lackawanna Steel Company without switching charges.

Work has been started at South Kaukauna, Wis., on the new foundry and machine shop of F. F. Hoehne.

The Rochester Bridge Company, Rochester, Ind., which contemplated removal to another city because of inability to make satisfactory arrangements for a site for a new plant, has now come into possession of 7 acres at the junction of two railroads in Rochester and will remain. The capital stock has been increased to $30,000, and a factory will be built twice the size of the present plant, the force of employees to be increased to 200.

Fires.

The large factory and automobile repair plant of the George J. Warden Company, Cleveland, Ohio, was burned April 29, the loss being about $40,000.

The plants of the Lockport Rubber Company and Susquehanna Smelting Company at Lockport, N. Y., were burned April 28, the combined loss being $100,000.

The leather manufacturing plant of the A. B. Clark Company, Peabody, Mass., was damaged $50,000 by fire April 28.

The machine shop, power house and other buildings of the Big Vein Coal Company at Pocahontas, Va., were damaged $25,000 by fire April 20.

Hardware.

The Johnson Bros. Mfg. Company, Albert Lea, Minn., has succeeded the Sharp Mfg. Company and will continue the manufacture of windmills and a few other specialties.

The Staley Mfg. Company has been organized at Martinsville, Ind., and incorporated with $25,000 capital stock, to manufacture washing machines. The directors are Harrison L. Staley, Clarence M. Schnaister and Charles E. Hubbard.

The Ideal Fence Post Company has been organized at Portland, Ind., and incorporated with $10,000 capital stock, to manufacture machinery for the making of patent fence posts and braces. The incorporators are C. H. Ayers, W. C. Gaunt, H. H. Gilmore and others.

The Robinson Steel Wrench Company, Gary, Ind., has been organized with $10,000 capital, to manufacture wrenches. The incorporators are Willis E. Robinson, Harry H. Clark and Alfred D. Milteer.

Miscellaneous.

The Field Force Pump Company will at once commence construction of a one-story brick addition to its factory at Elmira, N. Y.

The Columbia Silica Company has commenced building operations at the new works to be erected near Portage, Wis., where heavy machinery for the manufacture of sand-lime brick will be installed.

The Milwaukee Wire Bound Box Company, Milwaukee, Wis., has been incorporated by J. B. Sanborn, G. Sanborn and I. Weismell, with a capital stock of $30,000.

The Milwaukee Furnace Company, Milwaukee, Wis., has been incorporated with $25,000 capital stock by Wm. C. Koch, Jr., and others. It is understood that temporary quarters have been obtained and that a plant will be built later.

The John J. Gibson Company has been incorporated at Buffalo, N. Y., to manufacture motors, engines, cars and automobiles, with a capital stock of $20,000. Jos. N. Gregory, E. G. Thompson and Geo. Roughhead, Jr., are the incorporators.

The Garny-Mehserle Machine & Auto Company has been incorporated at Rochester, N. Y., to manufacture motors, engines, cars and vehicles. Geo. Garny and Henry Mehserle are interested.

The Susquehanna Smelting Company, Lockport, N. Y., whose electric smelting plant at Lock and Caledonia streets was badly damaged by fire April 28, has made arrangements with the owner of the property, the Holly Mfg. Company, Buffalo, to rebuild at once.

The Iron and Metal Trades

Low Wire Prices May Be Short Lived.

April Pig Iron Production Smaller Than Expected.

The reduction in the prices of wire, which came somewhat earlier and was more radical than expected, seems to have been made to clarify the situation. Prices had been drifting off for some weeks and had reached a point about midway between the old schedule and that now announced. It is intimated that it will not be in force long and that the course taken will be that pursued in the bar trade, where the low prices have been withdrawn, and in the plate and structural branches where a higher level of prices is being aimed at. Bookings are expanding in quantity and are sound in character.

The markets for finished iron and steel are firmer, but have not yet endured the test of any serious withdrawal of consumers, which may or may not come.

In the bar trade there is under consideration a large tonnage from the agricultural implement makers which it is expected will be closed soon. The struggle is over the question of extending deliveries over the whole year to July 1, 1910, at present prices. In some instances a compromise has been made by the acceptance of an advance of $1 per ton on material delivered after January 1, 1910.

Specifications against contracts for material are coming in freely from the steel car companies. Thus in two days the Carnegie Steel Company received 25,000 tons for axles, plates and shapes. Activity continues in the structural trade, and a large number of contracts for small and medium structures are being placed. The largest single transaction reported deals with 11,000 tons of fabricated material for bridges on the Gould system awarded to McClintic-Marshall.

Seaboard shipbuilders are in the market for an aggregate of 17,000 tons of plates for some freighters about to be built.

The largest sale of rails made for some time is that of 60,000 tons to the St. Paul road, which exercised its option to add 15,000 tons to the original inquiry for 45,000 tons. It is interesting to note that these rails are to be made of Bessemer steel, at the South Chicago works and not of open hearth steel, at the Gary plant.

It was expected that the Argentine order for close to 50,000 tons of rails would be given out this week, but the great strike, in which over 100,000 people are involved, including government employees, has probably delayed a decision.

Light rails, which have been out of line for so long a time, having been sold as low as $21.50, have been advanced by leading sellers and a new schedule is out, in which 40-lb. rails are placed at $26.

The merchant pipe makers have some good work in sight. Among the live projects is a 300-mile oil pipe line from Weston, W. Va., to Baltimore, for the Standard Oil Company.

There has been further activity in the pig iron markets and a number of large interests have placed additional orders, these including agricultural implement makers, pump builders and general founders.

The long continued shutdown of the Niagara power plants has so cut down production of ferrosilicon that there is a sharp scarcity, and prices have advanced materially.

April, a short month, showed about 100,000 tons smaller pig iron production than March, the figures for coke and anthracite furnaces being 1,738,877 gross tons and 1,836,194 tons, respectively. The daily rate of production in April was 57,962 tons, against 59,232 tons in March. Yet the weekly capacity active on May 1 was about 4500 tons (representing about 640 tons a day) more than on April 1, the figures being 413,710 tons and 409,217 tons, respectively. The explanation appears to be that the furnaces blown in in April were of greater average capacity than those blowing out, the large steel company stacks showing a net gain of four in the month, while the considerably smaller merchant stacks showed a net loss of six.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 5, 1909.	Apr. 28, 1909.	Apr. 7, 1909.	May 6, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$17.50
Foundry No. 2, Southern, Cincinnati	**14.50**	14.25	14.25	14.75
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.70
Basic, delivered, Eastern Pa.	15.00	15.00	15.00	17.25
Basic, Valley furnace	*14.00*	14.00	14.25	15.50
Bessemer, Pittsburgh	*15.65*	15.65	15.90	17.00
Gray forge, Pittsburgh	14.40	14.40	14.40	14.90
Lake Superior charcoal, Chicago	19.50	19.50	19.50	20.00
BILLETS, &c., Per Gross Ton:				
Steel billets, Pittsburgh	23.00	23.00	23.00	28.00
Forging billets, Pittsburgh	25.00	25.00	25.00	29.00
Open hearth billets, Philadelphia	*24.50*	25.40	25.40	29.20
Wire rods, Pittsburgh	*29.00*	29.00	33.00	35.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**14.00**	13.50	13.00	12.00
Steel rails, melting, Philadelphia	**14.00**	14.00	13.25	12.75
Iron rails, Chicago	**16.50**	16.50	15.75	14.75
Iron rails, Philadelphia	17.00	17.00	17.00	17.00
Car wheels, Chicago	**14.75**	14.50	14.50	12.50
Car wheels, Philadelphia	**14.50**	14.00	14.00	14.00
Heavy steel scrap, Pittsburgh	**14.25**	14.25	14.00	12.75
Heavy steel scrap, Chicago	**13.00**	12.75	12.25	10.50
Heavy steel scrap, Philadelphia	**13.75**	13.50	13.25	12.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.35*	1.35	1.37	1.46
Common iron bars, Chicago	*1.25*	1.25	1.32½	1.65
Common iron bars, Pittsburgh	1.30	1.30	1.30	1.50
Steel bars, tidewater, New York	*1.31*	1.31	1.36	1.76
Steel bars, Pittsburgh	*1.15*	1.15	1.20	1.60
Tank plates, tidewater, New York	*1.41*	1.41	1.46	1.86
Tank plates, Pittsburgh	*1.25*	1.25	1.30	1.70
Beams, tidewater, New York	*1.41*	1.41	1.46	1.86
Beams, Pittsburgh	*1.25*	1.25	1.30	1.70
Angles, tidewater, New York	*1.41*	1.41	1.46	1.86
Angles, Pittsburgh	*1.25*	1.25	1.30	1.70
Skelp, grooved steel, Pittsburgh	*1.20*	1.20	1.25	1.55
Skelp, sheared steel, Pittsburgh	*1.30*	1.30	1.35	1.65
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh	*1.60*	1.80	1.95	2.05
Cut nails, Pittsburgh	*1.65*	1.70	1.80	1.90
Barb wire, galv., Pittsburgh	*1.90*	2.25	2.40	2.50
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.87½*	12.87½	13.00	12.87½
Electrolytic copper, New York	**12.62½**	12.62½	12.50	12.62½
Spelter, New York	**5.02½**	5.02½	4.82½	4.65
Spelter, St. Louis	**4.90**	4.95	4.67½	4.50
Lead, New York	**4.22½**	4.25	4.12½	4.20
Lead, St. Louis	**4.10**	4.15	4.00	4.10
Tin, New York	*29.10*	29.25	29.25	31.05
Antimony, Hallett, New York	7.75	7.75	7.75	8.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.64	$3.64	$3.64	$3.89

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.25c., net; I-beams over 15 in., 1.35c., net; H-beams over 8 in., 1.45c.; Angles, 3 to 6 in., inclusive, ¼ in. and up, 1.25c., net; angles, over 6 in., 1.35c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.45c., base, half extras, steel bar card; tees, 3 in. and up, 1.25c., net; zees, 3 in. and up, 1.25c., net; angles, channels and tees, under 3 in., 1.20c., base, half extras, steel bar card; deck beams and bulb angles, 1.60c., net; hand rail tees, 2.70c., net; checkered and corrugated plates, 2.70c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.25c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per

square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c., f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c. Box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Galvanized sheets, Nos. 13 and 14, 2.30c.; Nos. 15 and 16, 2.40c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.35c.; No. 30, 3.60c. Painted roofing sheets, No. 28, 1.55c. per square. Galvanized roofing sheets, No. 28, 2.80c. per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, 4½ to 8 in., are 78 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel.
1 to 1½ in.	50
1¾ to 2¼ in.	62
2¾ to 5 in.	70
2½ in.	64
6 to 13 in.	62

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Wire Rods.—Bessemer rods, $29; chain rods, $29; basic rods, $30.

Chicago.

FISHER BUILDING, May 5, 1909.—(*By Telegraph.*)

The foremost features of interest in market developments are the stiffening of prices that has taken place in the last few days on structural shapes, plates and bars, and the official announcement of a sharp reduction, effective May 1, on wire and wire nails. The leading mills, fortified by the fair amount of tonnage brought out by the extremely low prices recently offered on the heavier lines above named, have decided to stand for a minimum that means an advance of $1 a ton or more. This action did not become effective until the latter part of last week, but it has already been influential in creating a decidedly stronger feeling which is reflected in the disposition shown by buyers to recognize the move as fully warranted by underlying conditions. The cut in wire and wire products was not unexpected, and, while perhaps more radical than was generally anticipated, it is realized as tending to support rather than demoralize the market. Instead of covert concessions which left the buyer in doubt as to the real price level, the new schedule fixes a basis upon which to build upward. With the exception of bars, the prices quoted are for orders with specifications or specific contracts such as are involved in orders for structural material required for a definite structure. Attention is centered upon the steel bar requirements of the implement trade, which are now being entered for delivery up to January. It is expected that within the next week or ten days the bulk of this business will be placed. Old material is in better demand, there being a ready market for all the steel grades that are offered.

Pig Iron.—The iron booked last week by sellers, although making but a moderate aggregate, was sufficiently large to show conclusively that quite a number of hesitating buyers finally decided to come in at the new price of $11.50, Birmingham. This basis seems to be pretty well established, as far at least as Southern iron is concerned. Of such sales one interest reports 1000 tons at $11.50 for third quarter and 750 tons at $12 for fourth quarter. This schedule represents the position of some producers, while others, including the leading Southern interest, are selling through the entire second half at $11.50. The largest single purchase reported included a portion of the second half requirements of a large Indiana plow manufacturer, the amount taken being about 6000 tons, most of which is understood to have gone to Northern furnaces. About one-third of the tonnage was Bessemer, the remainder being foundry grades. A considerable number of the orders entered by local furnaces were for malleable iron, practically all of it going to the agricultural implement foundries. There is no demand for malleable from other sources. The heavier consumers turning out railroad malleables are still postponing deliveries on contracts made last November. The local furnaces continue to hold at $16, at furnace, although occasional concessions of perhaps 25c. a ton are made from this price to meet outside competition. The general opinion is that the force of the recent buying movement is pretty well spent, and that the market is likely to experience another period of pronounced dullness. The following quotations are for May and June delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.00 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.35 to 15.85
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	14.35 to 14.85
Southern mottled	14.10 to 14.60
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.90 to 18.40
Jackson Co. and Kentucky silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %	21.90 to 22.40

(*By Mail.*)

Billets and Rods.—So far as actual sales are concerned, nothing of particular interest has developed in the past week. More inquiries, however, are coming out, among them being one for 500 tons of forging billets from a prominent local consumer for delivery through the remainder of the year. There has been no quotable change in prices, although the market is distinctly firmer, and there is little disposition on the part of sellers to recede from $26, Chicago, on forging billets, which for some weeks has been only a nominal quotation. No transactions are reported in wire rods, the leading interest not being an active factor in the market at the present time.

Rails and Track Supplies.—None of the rail tonnage previously reported as under construction has been formally placed, but the prospects are that the requirements of the Chicago, Milwaukee & St. Paul Railroad, which are believed to have been practically arranged for, will be nearer 65,000 than 50,000 tons, as was first indicated; figuring on this basis, there are now 80,000 tons likely to be placed in the near future. The demand for bolts is rather better than for spikes, the latter being only fairly active. A moderate increase in light rail orders is noted, but the business is somewhat scattered and irregular. Departures from the regular price of $24 for 25 lb. to 45 lb. sections are less general and now rarely exceed $1 a ton.

Structural Material.—Among the fabricating contracts placed last week are 1000 tons taken by the Kenwood Bridge Company for an addition to the Pullman Company's car shops, and 2000 tons for a hotel at Little Rock, Ark., awarded to the Brown & Ketchum Iron Works. Two contracts taken by the Minneapolis Steel & Machinery Company included 225 tons for the Little Falls hydro-electric power station, Spokane, Wash., and 327 tons for the Commercial Club Building, Salt Lake City, Utah. A new building for the Union Drop Forge Company, Chicago, requiring about 400 tons, will be fabricated by the Kenwood Bridge Company. Bids have been opened on several small bridges for the Sanitary District Commission, amounting to around 800 tons, on which George W. Jackson, Inc., was the low bidder, and a general contract including 200 tons for a new building to be constructed by M. J. Patterson for the Modern Smelting & Refining Company, Denver, Col. The Anaconda Company has placed an order for 2500 tons for the construction of penstocks at Great Falls, Mont., and the Cambria Steel Company has secured the contract for 5000 tons for the buildings comprising the new plant of the Inter-Ocean Steel Company. Bids will soon be asked for the construction of a grand stand to be erected in the State Agricultural Fair Grounds at St. Paul; if all steel construction is adopted, 2700 tons will be required, but reinforced concrete construction may be chosen, in which event not more than 600 tons of steel, outside of reinforcing concrete bars, will be used. Plans are also being prepared for a coliseum at Des Moines, Ia., in which the amount of steel used will depend upon the character of construction. The St. Paul Railroad has inquiries out for 400 tons, besides which there are a large number of small inquiries for miscellaneous work from various sources. Prices on plain material have stiffened up, and are this week being held more firmly than at any time since the February cut. Instead of representing the market only in a nominal way, as has been the case for some weeks, 1.40c., Chicago, is now stated to be the actual minimum, and that only for orders accompanied by specifications for early shipment. The mills are not anxious

to contract ahead except at an advance of $1 or more a ton over this price, and are making no open quotations on such business. The firmer feeling established has already manifested itself in a livelier interest displayed in the market by prospective purchasers.

Plates.—The demand for plates is steadily widening. Some classes of consumers, such as boiler and tank shops, which for months have been extremely dull, are now coming into the market for moderate requirements. The car shops are not yet actively enough engaged to contribute heavily to the increasing movement, but are ordering somewhat more freely. Having depleted their stocks as far as was practicable, the leading jobbers have recently been buying liberally for replenishment, and a large aggregate tonnage has reached the mills from this source. The firmer tendency which made its appearance in the market last week had the effect of bringing to closure a considerable amount of pending business at prices favorable to the buyer. These, in the meantime, have been withdrawn, and the market has settled firmly at 1.40c., Chicago, for prompt orders, with specifications, while on contracts to be specified against up to the end of the year an advance over this price is asked. No definite schedule is fixed for such deliveries, the mills preferring to handle each transaction upon its merits.

Sheets.—The firmness observed in some other lines of finished material has apparently not extended to sheets. The recognized schedule as quoted under "f.o.b. Pittsburgh" prices is being shaded by some mills, while others with better filled order books are making no concessions. Specifications are being supplied without reluctance, and new orders, though as a rule individually small, are quite numerous. Jobbers report a fair amount of business, with consumers buying conservatively for nearby needs.

Bars.—The firmer feeling developed in bars last week has proved effective in bringing out a considerable tonnage of tardy business that had been held back for some time awaiting developments. When it became apparent that the bottom was not reached by the first cut made, many buyers hesitated to come in at concessions subsequently offered, hoping to secure still lower figures. The stronger tone of the past few days, however, has convinced many that the extreme limit was reached at 1.10c., Pittsburgh. Considerable business for immediate shipment was entered prior to May 1 at this price, but since then the market has firmed up to 1.15c., Pittsburgh, or 1.30c., Chicago. At these figures contracts are being entered for delivery through the remainder of the year. On this basis the implement makers are coming into the market, and a large tonnage from this source is under consideration; within the next few days much of it will be placed. Contracts for delivery beyond January 1 are being entered only at a substantial advance, and no open quotations are being made applying to future requirements in general. There is little or no improvement in bar iron, the demand being restricted to small lots as needed. We quote bar iron at 1.25c. to 1.30c., Chicago, which prices apply only to specified orders, the mills declining to enter forward contracts at these figures.

Merchant Pipe.—While the actual business represented by orders received shows no marked improvement, the amount and character of late inquiries furnish ground for the expectation of early betterment. The stronger sentiment developed in other sections of the market will, it is believed, prove effective in bringing out more liberal orders for pipe. Jobbers have for months been buying only hand to mouth supplies, and a good deal of tonnage will be required to restore stocks to their normal size. Lack of confidence in the general stability of the market has operated against the expansion of trade, and the prospects of a general firming up of values will, if realized, induce buyers to purchase more liberally. Prices are reported to be well maintained, and the outlook for growing activity is distinctly encouraging.

Boiler Tubes.—The movement in boiler tubes is slow, but that the boiler shops are gradually getting busier is evidenced by more frequent orders for small lots. Until the demand becomes more general, however, no decisive improvement can be reported.

Merchant Steel.—The attention of the trade is now centered upon the requirements of the implement trade for the coming season. A large tonnage of such business is under negotiation, and it is expected that within the next week or two a considerable portion of this business will have been entered for delivery up to July 1, 1910. It is understood that the mills are asking an advance over the current market prices on new season contracts. Since the implement makers have practically furnished the work of the present season, new orders and specifications are light.

Cast Iron Pipe.—It is understood that the award of 2000 tons of pipe made last week by Salt Lake City, Utah, to a local contractor, has to be ratified by the City Council, which will act upon it early this week. In the meantime the order for pipe has not yet been placed. Contracts let for 700 tons by the city of Hancock, Mich., and 600 tons by the city of Dayton, Ohio, were secured by the United States Cast Iron Pipe & Foundry Company. Aside from the 4000 tons for the city of St. Louis, Mo., and 2800 tons for Hugho, Okla., scheduled for letting this week, no new inquiries of notable size are reported. Influenced by the increasing firmness of pig iron, prices of pipe are said to be correspondingly stiffer. We quote, per net ton, Chicago, as follows: Water pipe, 4 in., $27.50; 6 to 12 in., $26.50; 16 in. and up, $24.50, with $1 extra for gas pipe.

Metals.—The market is extremely quiet. Consumers show little interest in copper or other metals. The few sales reported are for small lots. Prices are stationary throughout the list. There is likewise little demand for old metals, but in view of the general industrial improvement, dealers are hopeful of a favorable reaction in the near future. Quotations are as follows: Casting copper, 12¾c. to 13c.; lake, 13¼c. to 13½c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 31c.; small lots, 33c.; lead, desilverized, 4.15c. to 4.25c., for 50-ton lots; corroding, 4.40c. to 4.50c., for 50-ton lots; in car lots, 2½c. per 100 lb. higher; spelter, 5.25c. to 5.35c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¼c.; sheet zinc is $6.75, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13c.; copper bottoms, 11¼c.; copper clips, 11c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 7c.; lead pipe, 3.75c.; zinc, 3.90c.; pewter, No. 1, 21c.; tin foil, 23c.; block tin pipe, 26c.

Old Material.—Strengthened by a better demand from consumers, prices have moved up from 25c. to 50c. a ton, and in some cases even more. Scrap values are peculiarly susceptible to influences that would have but slight effect upon other commodities, and it does not follow, therefore, that the demand responsible for the present advance was notably large. At the same time it is significant that it is a consumer's rather than a dealer's market, in which the tonnage offered is comparatively light. As was predicted, the list of material offered last week by the Chicago, Burlington & Quincy brought good prices. No. 1 cast sold for $13.25; railroad malleable, $12.25; car wheels, $14.75, all per net ton; rerolling steel rails, $13.75; frogs, switches and guards, $13.25; short rails, $14.25; heavy melting steel, $13, all per gross ton, delivery at connecting lines. Considerably more tonnage than was listed was disposed of, practically all of it being taken by the consumers. The market is undoubtedly stronger throughout, with an especially good demand for all grades of steel scrap. The following prices are per net ton, f.o.b. Chicago:

Old iron rails	$16.50 to $17.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	14.00 to 14.50
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheels	14.75 to 15.25
Heavy melting steel scrap	13.00 to 13.50
Frogs, switches and guards, cut apart	13.00 to 13.50
Mixed steel	10.50 to 11.00

The following quotations are per net ton:

Iron fish plates	$15.25 to $15.75
Iron car axles	18.00 to 18.50
Steel car axles	16.25 to 16.75
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	11.75 to 12.25
Springs, knuckles and couplers	12.50 to 13.00
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	9.50 to 10.00
Mixed busheling	8.00 to 8.50
Iron axle turnings	8.00 to 8.50
Soft steel axle turnings	7.00 to 7.50
Machine shop turnings	7.00 to 7.50
Cast borings	5.25 to 5.75
Mixed borings, &c	5.25 to 5.75
No. 1 mill	7.00 to 7.50
No. 2 mill	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.25 to 11.75
Railroad malleable	12.25 to 12.75
Agricultural malleable	10.75 to 11.25
Pipes and flues	8.75 to 9.25

Birmingham.

BIRMINGHAM, ALA., May 3, 1909.

Pig Iron.—This market is fairly active, with the views of producing interests apparently unchanged. The quotation of $12, Birmingham, on a No. 2 foundry basis, for deliveries covering the last quarter, which has been adopted by the majority of producers, is so far prohibitive of trading for that requirement. The tonnage engaged recently for third quarter delivery, with the privilege of extending shipments into the fourth quarter, is comparatively small, although it is generally understood that the $11.50 schedule is available for deliveries covering the entire last half. So far as can be ascertained, the schedule of $11.50, Birmingham, has not been shaded for third quarter deliveries. The sale of 1500 tons of No. 3 foundry for shipment within the third quarter is reported at $11, and the aggregate of lots around 200 tons sold on a $11.50 basis is attractive. One or more lots of a few carloads recently sold by analysis for $12, and firm offers of $11.50 for No. 2 have been declined by the smaller producers. For spot delivery, it is quite likely that lower figures could be had than is indicated by quotations. A basis of $11.25 has been mentioned as ac-

ceptable by some concerns in order to move their daily output, and in other cases it is thought that $11 for No. 2 foundry would not be refused. It is pointed out that a significant portion of the aggregate order-book requirement is represented by deferred shipments, and in some cases local furnace conditions are such that departures from the market quotation is warranted rather than store the surplus output resulting from failure to receive shipping instructions. The statement that the total surplus stock has been materially reduced is substantiated by the announcement that two additional stacks will be put in operation as soon as practicable. Reports from various sources as to the outlook are favorable and the market is considered on a firm basis.

Cast Iron Pipe.—The business transacted in this market during the past week is of comparatively small volume. Orders covering requirements for maintenance work have been practically the only considerations, and prices brought out are hardly tests of market values. The tonnage to be awarded within the present week is expected to determine the attitude of local producers as to prices, and from the tendency manifested it is thought that a less disposition to shade quotation on municipal contracts will be indicated. There is still more or less apprehension among the authorities as to the result of the reduction in the freight rate on pig iron to Pacific Coast points, but it is not altogether improbable that a reduction in the cast iron pipe rate will be effected. The principal addition to orders in sight is some 2000 tons for the city of Los Angeles, Cal., which has just been advertised. We quote water pipe as follows per net ton, f.o.b. cars here: 4 to 6 in., $25; 8 to 12 in., $24; over 12 in., average $23, with $1 per ton extra for gas pipe.

Old Material.—An improvement in the inquiry is noted without having resulted in more sales. The price consideration for such tonnage as is being moved has been very much at variance, with a tendency to decline. In the absence of a criterion of values dealers' asking prices are quoted, which are as follows, nominally:

Old iron rails	$13.50 to $14.00
Old iron axles	14.50 to 15.00
Old steel axles	12.00 to 12.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.00 to 9.50
No. 2 country wrought	8.50 to 9.00
No. 1 machinery	10.50 to 11.00
Tram car wheels	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Stove plate and light cast	7.50 to 8.00
Cast borings	4.00 to 4.50

Buffalo.

BUFFALO, N. Y., May 4, 1909.

Pig Iron.—A large aggregate tonnage has been sold from this market during the past week, both in foundry grades and malleable. The low figures which have been recently made, together with the prospect of an immediate reversal in the low trend of prices to an upward movement, have had their influence in inducing some heavy purchases. Increased shipments are now going forward from all the local furnaces closely approximating their capacity. One furnace interest alone received orders for 25,000 tons of foundry grades and malleable during the week. A large proportion of the orders booked are for May and June delivery, although fairly good contracts have been entered for third quarter delivery, but at increased prices over those for spot and present quarter deliveries. For last half orders accepted are at 50c. to $1 per ton above prices for spot delivery. We quote as follows for current quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	$15.50 to $15.75
No. 2 X foundry	14.75 to 15.50
No. 2 plain	14.50 to 15.25
No. 3 foundry	14.50 to 15.00
Gray forge	14.25 to 14.75
Malleable Bessemer	15.00 to 16.00
Basic	15.50 to 15.75
Charcoal	19.50 to 20.00

Finished Iron and Steel.—The week has shown continued improvement in orders and specifications on contracts in all finished products, amounting almost to a rush on plates, bars and shapes, at prices ruling about $1 per ton higher than last week. Prices are now steady for bars at 1.15c. to 1.20c., Pittsburgh, and 1.25c. to 1.30c., Pittsburgh, for plates, although for large tonnages prices are possibly shaded slightly in some instances. If new business keeps its present pace of increase for the next two weeks a further advance in prices seems probable. There is also an improvement in demand for billets and rails and some good orders have been placed. The Lackawanna Steel Company is now operating its open hearth department at full capacity. One of the local sales agencies reports orders during the week for 1200 tons of light rails and 500 tons of standard rails. Business in structural steel holds up well. Bids are to be received this week for the steel required for the 300-room addition to the Lafayette Hotel here, about 800 tons, and next week bids will be asked for structural material for the H. A. Meldrum Company's department store addition, involving considerable tonnage. Contract has been given the Lackawanna Steel Company for 8000 tons of structural shapes for wool warehouses to be erected at Boston. The Charles F. Ernst's Sons Iron Works was low bidder on the 400 tons of steel for the McArthur Building of this city, bids for which were taken last week. The local agency of the American Steel & Wire Company reports that the reduction in the price of wire products and wire nails which went into effect on Monday, making the lowest prices on these commodities quoted for many years, has already influenced the placing of a tremendous tonnage, as it is announced that prices are subject to change without notice and are effective only for immediate specification and shipment.

Old Material.—There has been a slight improvement in the demand. Consumers are coming into the market with inquiries for considerable tonnages. Dealers are inclined to hold for a betterment in prices, however, so that actual transactions have been few. Dealers' prices per gross ton, f.o.b. Buffalo, are approximately as follows:

Heavy melting steel scrap	$13.00 to $13.50
Low phosphorus steel scrap	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.75
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	15.00 to 15.50
Old iron axles	18.00 to 18.50
Old car wheels	14.50 to 14.75
Railroad malleable	12.50 to 13.00
Boiler plate	11.00 to 11.50
Locomotive grate bars	11.25 to 11.75
Pipe	10.00 to 10.50
Wrought iron and soft steel turnings	7.50 to 8.00
Clean cast iron borings	6.50 to 7.00
No. 1 busheling scrap	12.00 to 12.50

Pittsburgh.

PARK BUILDING, May 5, 1909.—(*By Telegraph.*)

Pig Iron.—The largest transaction of the week was a purchase of about 2000 tons for last half delivery by a local consumer, made up of No. 2 foundry, Bessemer and low phosphorus iron. The average price of shipments of Bessemer iron in April was $14.90, Valley furnace, and basic $14.15, Valley furnace, showing a reduction in the Bessemer average over March of 54 cents, and in the basic average of 79 cents. We quote Bessemer iron at $14.75 to $15; basic, $14; malleable Bessemer, $14.25; No. 2 foundry, $14 to $14.25, and gray forge, $13.50, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—Reports are that inquiries for billets are somewhat better, and $23, Pittsburgh, for both Bessemer and open hearth billets seems now to more nearly represent the market than for some time, prices being firmer. Specifications against contracts for sheet and tin bars are being received quite freely by the mills. We quote sheet and tin bars at $25, Pittsburgh.

(*By Mail.*)

Announcements by the American Steel & Wire Company, Pittsburgh Steel Company and other leading wire interests of a reduction in the price of wire nails to $1.60 per keg, plain wire to the basis of 1.40c. per lb., and galvanized barb wire to 1.90c., were not a surprise to the trade, but the cuts were heavier than generally anticipated. Orders for wire products have been coming in very freely since the reductions were made, and we are advised that the manufacturers are refusing to book contracts for long time delivery at the new prices, but will only accept orders accompanied with specifications and for reasonably prompt shipment. Some in the trade believe that the reduction was made at an inopportune time and may have an adverse influence on the rest of the market. There is no doubt that orders for all kinds of finished material have been increasing, and specifications against contracts are being received by the mills at a very satisfactory rate. In two days this week the Carnegie Steel Company received specifications for nearly 25,000 tons of material going into cars, such as axles, plates and shapes. All the mills are entering more orders and shipping out more tonnage than at any time in the last year and a half. The Carnegie Steel Company is operating to-day about 70 per cent. of its blast furnaces and practically the same percentage of its rolling capacity is also active. Jones & Laughlin, Republic and other large steel interests are steadily increasing their percentages of operation. Prices on most finished lines are firmer than for some time, and 1.15c., Pittsburgh, on steel bars, and 1.25c. on plates and structural shapes are being pretty firmly held. The local demand for pig iron does not show much betterment, but some fair sized sales have been made. Specifications against contracts on billets, sheet and tin bars are better, and prices

on these products seem to be hardening. The scrap trade is also showing a stronger tone. While the new demand for furnace and foundry coke is probably a little better, prices as yet show no improvement.

Ferromanganese.—Some inquiry has come up in the past week, and prices seem to be a trifle firmer. We continue to quote 80 per cent. foreign ferro at $41 to $41.50, Baltimore, or $42.95 to $43.45, Pittsburgh. A sale of 50 tons to an outside consumer is reported at about the first named price.

Ferrosilicon.—This material is scarcer, and for prompt delivery prices have shown a sharp advance. We quote 50 per cent. at $60, Pittsburgh, and some sellers are asking higher prices.

Rods.—The heavy reductions in prices of wire nails, plain and barb wire effective do not apply to rods, which were reduced about $4 a ton some time ago. We, therefore, continue to quote Bessemer and chain rods at $29 and open hearth at $30, Pittsburgh.

Skelp.—The demand for grooved and sheared iron plates continues quite active, and some fair sized orders are also being placed for steel skelp. The market is firm and it is believed that prices may shortly be higher. We quote grooved steel skelp at 1.20c. to 1.25c.; sheared steel, 1.30c. to 1.35c.; grooved iron, 1.40c. to 1.45c.; and sheared iron, 1.50c. to 1.55c. for ordinary widths, all f.o.b. Pittsburgh.

Steel Rails.—Light rails are firmer than for some time, and the average of prices being obtained by the light rail makers is higher. The Carnegie Steel Company received in the past week orders and specifications against contracts for about 1500 tons of light rails, but expects to increase this amount considerably during this week. Last week the three Edgar Thomson rail mills at Bessemer were closed down, being unable to get open hearth blooms from the Homestead Works from which to roll some open hearth rails, but this week the three mills are on again and are being operated to about 40 per cent. of capacity. No large orders for standard sections have been placed, but specifications against contracts are coming in, mostly for small lots. Standard sections remain at $28, at mill. We quote light rails, 25 to 45 lb., at $25 to $26; 20-lb. at $26; 16-lb. at $27; and 8, 10 and 12 lb. rails at $28 to $29, at mill. Splice bars are 1.50c., at mill.

Plates.—Inquiries are in the market for about 17,000 tons of plates to be used on freight carrying boats to be built by Eastern concerns. The Carnegie Steel Company is furnishing about 11,000 tons of plates and shapes for two twin boats, the Conemaugh and the Wissahickon, for the Erie & Western Transportation Company, an interest of the Pennsylvania Railroad. The order for these was placed with the Carnegie Steel Company in March. Specifications against contracts for plates and shapes are coming in very freely from the steel car companies, and the leading plate interests are operating their mills to about 75 per cent. of capacity. The general demand from boiler makers and other consumers continues quiet. The regular price of plates, ¼-in. and heavier, in carloads and larger lots, is firm at 1.25c., at mill, but on a very attractive order for prompt shipment it is possible that 1.20c., at mill, could be done. On small general orders for mill shipment, 1.30c. is being quoted.

Structural Material.—The contract for steel buildings for the Youngstown Sheet & Tube Company taken recently by the McClintic-Marshall Construction Company has been increased from 700 to 1000 tons, and the contract for the steel work for the new building of the Pittsburgh Athletic Club has been placed with the Brown-Ketchum Iron Works of Indianapolis, the steel, about 1400 tons, to be furnished by the Carnegie Steel Company. The contract for the erection of the Wilkinsburg High School has been placed with T. W. Finn, and the material, about 450 tons, will soon be bought. Reports that the steel for the new Second National Bank Building, in this city, had been given to the Jones & Laughlin Steel Company are premature, the Thompson-Starrett Company having the contract for the building, but the steel is not yet placed. Plans are being made for the building of a cantilever bridge over the Ohio River at Sewickley, which will require 7000 to 8000 tons. A great deal more work is coming up, and the general condition in the structural market is better than for some time. Prices on beams and channels up to 15 in. are reported firm at 1.25c., at mill, for large lots, and 1.30c. for small lots.

Bars.—Negotiations have been taken up with the implement makers on their season contracts for steel bars running a year from July 1 next, and a few of these contracts have been closed. Several leading steel bar mills absolutely refuse to sell beyond January 1 at present prices, but will take business for the first half of next year at about 1.25c. to 1.30c., at mill, to large consumers. Specifications against contracts are coming in very freely, and shipments by the mills are heavier than for some months. The demand for iron bars is only fairly active and is mostly in small lots. We quote steel bars at 1.15., at mill, in large lots and iron bars at about 1.30c., Pittsburgh.

Tin Plate.—The leading tin plate mills are operating actively practically full capacity and are receiving heavy specifications against contracts placed some time ago by the canning interests and other consumers. It is believed that in point of tonnage the tin plate trade this year will be the heaviest ever known. It is stated that the regular price of $3.40 on 100-lb. cokes is being maintained.

Sheets.—There is a gradual increase in new demand for sheets, more particularly in galvanized and roofing sheets, and as a rule the leading sheet mills are gradually increasing operations. Prices on sheets are not as firm as desired. We quote one pass box annealed black sheets No. 28 gauge at 2.20c., and galvanized of the same gauge, 3.25c. The regular price of painted roofing sheets No. 28 is 1.55c. per square, and of galvanized No. 28 is 2.80c. per square for 2½-in. corrugations, but prices on the latter items are being shaded.

Hoops and Bands.—Some small orders are being placed for prompt shipment to cover actual needs, but consumers are buying very conservatively, believing that prices may be lower. The nominal price of hoops remains at 1.60c. and bands at 1.20c., with steel card extras on the latter, but these prices are being materially shaded.

Spelter.—The demand has quieted down very much and prices are a shade weaker. We quote prime grades of Western spelter at 4.90c., East St. Louis, equal to 5.02½c., Pittsburgh, but on a firm offer and for a large lot this price might possibly be shaded.

Railroad Spikes.—The demand from the railroads continues very dull and is mostly for small lots for track laying purposes. We quote railroad spikes at $1.65 to $1.70 for 5½ x 9-16 in. and $1.75 to $1.80, base, for the smaller sizes, in carload lots, 5c. additional per keg being charged for small lots.

Merchant Pipe.—Reports are that the Standard Oil Company is in the market for about 300 miles of large sized pipe for the laying of an oil line from Weston, W. Va., to Baltimore, the oil to be exported from the latter point. The People's Natural Gas Company is inquiring for 60 miles of 14-in. pipe to be used in extending its service mains at Altoona during the summer months. Some other large gas and oil line projects are under way, which will require a very large tonnage of pipe. We are advised that the general demand for pipe is keeping up very well, new orders entered by the mills in April showing an increase over March. Regular discounts on both iron and steel pipe are reported as being firmly held.

Boiler Tubes.—The demand for both locomotive and merchant tubes is dull, and there is some shading in prices.

Iron and Steel Scrap.—The scrap lists of the Pennsylvania and Baltimore & Ohio roads came out to-day and cover a heavy tonnage. Bids on the Pennsylvania scrap close May 11 and on the Baltimore and Ohio scrap on May 12. The general demand for scrap is showing some betterment, and prices are firmer. Dealers quote about as follows per gross ton f.o.b. Pittsburgh, unless otherwise stated: Heavy steel scrap for Monessen, Pa., or Steubenville, Ohio, delivery, $14.50, and for Pittsburgh delivery $14.25; cast iron borings, $7.75 to $8; bundled sheet scrap, $10.50 to $11 at point of shipment; No. 1 cast, $13.50 to $14; No. 2, $12 to $12.50; No. 1 railroad malleable, $14; sheet bar crop ends, $16 to $16.50; low phosphorus melting stock, $16.25 to $16.50; rerolling rails, $14.25 to $14.50; steel axles, $17 to $17.50; grate bars, $10.50 to $11; old car wheels, $14.75 to $15; machine shop turnings, $9 to $9.25; locomotive tires, $16.50 to $16.75; locomotive axles, $22 to $22.50; iron rails, $15.50; iron axles, $18 to $18.50.

Coke.—It is now stated that plans under way for a consolidation of a number of the leading independent coke plants give more promise of being successfully consummated. It is stated that a large number of the leading independent coke makers has given options on their plants good until October 1, this year. The general demand for both furnace and foundry coke is showing some betterment, and prices are a shade stronger. Standard makes of furnace coke for prompt shipment are held at $1.60 to $1.65, per net ton, at oven, and 72-hr. foundry at $1.85 to $1.90, at oven. The output of coke in the Upper and Lower Connellsville regions last week was 230,229 tons, a decrease over the previous week of over 3000 tons.

Frank W. Highberger, formerly in the rail and billet sales department of the Carnegie Steel Company, Pittsburgh, is now connected with F. N. Armour, Columbia Bank Building, Pittsburgh, sales agent for the Mt. Pleasant Coke Company and other coke interests.

Boyts, Porter & Co., Connellsville, Pa., manufacturers of Yough steam pumps, plungers and piston patterns, are distributing a circular giving a complete list of the coke ovens and their owners, together with post office address and nearest railroad stations to the ovens, in the Upper and Lower Connellsville regions. It shows that on April 1, 1909, there was a total of 24,559 ovens in the Upper Connellsville region and 15,911 ovens in the Lower Connellsville region.

Cleveland.

CLEVELAND, OHIO, May 4, 1909.

Iron Ore.—The labor troubles on the lakes are causing but little worry for the vesselmen, who do not expect to have any serious difficulty in getting all the men they want to operate their boats. A strike was declared in effect May 1 by the Lake Seamen's Union as a result of the enforcement of the open shop policy by the Lake Carriers' Association. The Pittsburgh Steamship Company started several more boats during the week and now has over 50 in commission. There are enough other boats in commission to handle all the business that will come out for some time. Shipments of ore have started from the head of Lake Superior, and a number of cargoes will reach Lake Erie ports in the next few days. About all the merchant ore firms have started shipments in a small way. The ore market is still quiet, the only sales reported during the week being small lots for early delivery for mixtures. Some look for a buying movement soon, but others do not expect much activity until the tariff question is settled. There is little talk about prices and the opinion is becoming settled that last season's prices will be maintained. Some more vessel tonnage has been chartered in the ore trade at last year's rates. The ore tonnage on Lake Erie docks is estimated at about the same as on May 1 last year. Dock shipments are fairly good. Ore prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market has quieted down somewhat, but local furnace interests report a good demand in other sections. Quite a large tonnage of both foundry and malleable iron was sold in the East during the week, and inquiries are still quite plentiful from New England and other Eastern sections. Outside of the buying by the pipe interests and one or two other large consumers there has not been much sold to consumers in this territory in the past two or three weeks. Quite a number of inquiries for 500-ton lots and under have come out in the past few days, but consumers generally are unwilling to pay the price asked. All the Valley furnaces seem to be holding quite firmly now to $14.50, at furnace, for No. 2 foundry for the last half, and some tonnage has been taken on at that price. In some cases offers of $14.25 by buyers have been rejected. Local furnaces are not quoting lower than $14.50 for outside shipment and have sold some small lots at that price to points having the same freight rate from the Valley. For Cleveland delivery local furnaces quote No. 2 at $15, delivered. We note the sale of 2000 tons of malleable to a northern Ohio consumer for last half delivery. We quote No. 2 foundry at $14.25 to $14.50, Valley furnace. We quote delivered, Cleveland, as follows:

Bessemer	$15.65 to $15.90
Northern foundry, No. 1	15.25 to 15.50
Northern foundry, No. 2	14.75 to 15.15
Northern foundry, No. 3	14.25 to 14.75
Gray forge	13.90 to 14.40
Southern foundry, No. 2	15.60 to 15.85
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—The market is rather quiet, the only activity reported being in small lots of foundry coke. Prices remain about stationary. We quote Connellsville furnace coke at $1.55 to $1.65, at oven, for spot shipment, and $1.70 to $1.80 on contract. We quote standard 72-hr. foundry coke at $1.90 to $2.10 for spot shipment, and $2.10 to $2.25 on contract.

Finished Iron and Steel.—Local mill agencies have booked a heavy tonnage of steel bar contracts during the week at 1.15c., Pittsburgh, which price is being firmly maintained, and two of the leading independent mills that have taken on all the low priced bars that they care for advanced their price this week to 1.20c. The mills now have their bar trade, including the implement manufacturers, pretty much under contract for the balance of the year. Some contracts have been made with the implement men for delivery until July 1, 1910, the contracts specifying an advance of $1 a ton in the price after January 1. With a firmer market some bar contracts are now being placed on the 1.20c. basis. Prices on plates and structural material are also firmer. One or two independent mills took on some tonnage late last week on the 1.20c. basis for delivery until October 1, but this price has been withdrawn, and 1.25c., Pittsburgh, is being quoted as the minimum price, and this in most cases only for desirable business, the price of 1.30c. being maintained for small lots. At the 1.25c. price the leading interest is taking plate and shape orders only for immediate shipment. In addition to the new contracts all the mills report the receipt during the week of large specifications for steel bars and a good volume of orders for shapes and plates. Considerable new structural work, involving small lots, is still coming up, and, although local fabricating plants are busy, work is being taken at low prices. The Nickel Plate Railroad has given the contract for grade crossing elimination work in Cleveland to the American Bridge Company, requiring about 1400 tons of structural material, and similar work soon to be carried out by the city will require a somewhat larger quantity. T. H. Brooks & Co., Cleveland, were given the contract for the Longwood School, Cleveland, 300 tons. Bids will be received next week for the Anisfield Building, Cleveland, about 800 tons. There is some improvement in the demand for iron bars, and both the local mills are running. Prices are still unsatisfactory. We quote iron bars at 1.20c. to 1.25c., Cleveland. The demand for shafting has improved, but prices are weak. One mill reports orders taken for 1400 tons during the week. Mills have received some good stock orders from jobbers, and the latter report a good volume of business both in warehouse and direct shipment orders.

Old Material.—A better feeling prevails among dealers than for some time. This is attributed to a number of inquiries that have come from consumers who are feeling the market and to the stiffer prices on finished lines. The only effect so far on prices is a slight advance in heavy melting steel, turnings and drillings and busheling scrap, but the whole list is firmer and no round lots are offered at current prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$13.00 to $13.50
Old iron rails	15.50 to 16.00
Steel car axles	17.00 to 17.50
Old car wheels	14.00 to 14.50
Heavy melting steel	12.25 to 12.75
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	11.00 to 11.50
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$17.00 to $17.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	9.00 to 9.50
No. 1 busheling	10.50 to 11.00
No. 1 railroad wrought	12.00 to 12.50
No. 1 cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Bundled tin scrap	9.00

St. Louis.

ST. LOUIS, May 3, 1909.

Pronounced invigoration of finance and trade is shown by the recent statements of the leading local banks and trust companies. These institutions, which are doing approximately 85 per cent. of the business of St. Louis, exhibit loans and discounts of $178,618,572; cash and exchange of $98,531,236; total deposits of $248,718,046. The loans and discounts, as compared with the preceding statement in February, show an increase of $9,272,202, which, with a slight falling off in deposits, indicates an expansion in business of an encouraging volume. The gain in bank clearings for the month of April over those of the corresponding month last year is over 11 per cent., which is above the average gain.

Coke.—In the coke market the feature is good, steady buying, the demand being active, but as yet for legitimate current wants. There is an entire absence of speculative engagements—in fact, it is not the season of the year for making them. Prices are unchanged, but firmer. We quote for 72 hr. standard Connellsville foundry $2 at oven for prompt, and $2.25 to $2.35 for contract shipment over the balance of the year; some brands are held a trifle higher, while 1 to 1¼ per cent. sulphur has been sold at $1.80 for spot. One broker reports a sale of 300 tons of standard Connellsville and all the offices are finding a fair inquiry from local and country buyers.

Pig Iron.—The activity which has prevailed in the pig iron market for the past fortnight is still in evidence. Inquiries continue to be numerous and sales have been quite heavy. A gratifying feature consists in the broadness of the market, since business is coming from a wide range of territory as well as from local foundries. This applies not only to Northern iron, but to Southern as well, and to all grades, including foundry, Bessemer and basic. Ohio irons also have been selling in good quantities. As liberal inquiries are still pending (about 10,000 tons), the outlook is favorable for the demand being kept up, unless checked by a further advance. During the past month, however, the wants of consumers have been satisfied to a quite large extent, since it is known that sales have been heavy and the bookings of a leading interest, while the cut in price lasted, must have been very considerable. It is understood that the bulk of these sales were for forward shipment, and for this reason some of the trade were puzzled by this action of the interest referred to. Comparing the past month's business with that of the entire first quarter, some brokers state they did more in the one month than the previous three, and one house states that its sales were double. The De Camp Bros. & Yale Iron, Coal & Coke Company sold 10,000 tons of foundry iron to a leading St. Louis company, shipment over the last half, and among other sales 1200 tons Ohio iron for the same shipment. Another house reports a sale of 800 tons, part Northern and part Southern, while a third concern found buyers for between 5000 and 6000 tons. A fourth placed 2000 tons of Southern and 1000 tons of Northern. We understand that some Southern iron has been

sold in this market during the week at $12, Birmingham, for third quarter and last half delivery. It is stated that there is now no $11 iron on the market for any delivery. For shipment during May and June, $2 Southern foundry is offered at $11.50, Birmingham. For last half the asking price is $12, but on a firm offer of $11.50 a limited quantity may be bought of some furnaces.

Finished Iron and Steel.—There is a dull market for structural iron and steel in a large way, but fabricators are buying for filling numerous small contracts. While there are some large structures under way, the orders for material have been placed. Several contracts, however, will likely be made during the month. Agricultural implement manufacturers are busy, and wagon interests are also in the market. Standard rails have ruled quiet, but there is a large inquiry out. Light rails are slow. In track material there is a moderate business doing.

Old Material.—The inquiry from consumers is moderate, and, though it may be said to be mainly a dealers' market, prices are strong, and there is some speculative inquiry. The situation in the pig iron market sympathetically influences scrap iron and steel in the direction of a firmer feeling if not higher prices. It is also believed that in the near future the offerings on the part of the railroads will be light. Relaying rails continue to be urgently wanted, and are becoming quite scarce. Altogether, the outlook is much improved over the conditions which prevailed during March. We quote, per gross ton, f.o.b. St. Louis, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$13.00 to $13.50
Iron car axles	16.50 to 17.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	11.50 to 12.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	10.50 to 11.00
Stove pipe and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.00 to 8.50
Railroad sheet scrap	7.50 to 8.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.00 to 7.50

Lead, Spelter, Etc.—Lead is in fair demand at 4.15c. to 4.17c., East St. Louis; lead ore, $27 to $28 per 1000 lb., Joplin, base. Spelter is in good request, and held at 4.95c. to 5c., East St. Louis; zinc ore, $38 to $39.50 per ton, Joplin, base. Tin is ⅝c. lower; antimony, ⅛c. off; copper, unchanged. The demand for metals continues active.

Philadelphia.

PHILADELPHIA, PA., May 4, 1909.

A good volume of business continues in pig iron. In finished materials no further large contracts have been placed, although the aggregate of small orders shows some betterment. There has undoubtedly been some speculative buying in both crude and finished materials at the present range of prices, which are believed to be at the bottom, although the individual purchases have not been heavy and deliveries usually do not extend beyond the third quarter. The feeling, however, is more optimistic, although sharp advances in prices are not looked for until the general business situation improves. There is more inquiry for supplies for delivery over the last half of the year, but buyers hesitate when it comes to closing orders and sellers are not anxious to book heavy quantities for extended deliveries at current prices. A little more business has been done in billets, but at lower prices than recently quoted. The scrap market is firmer and more inquiry on the part of some consumers has resulted in advances in asking prices for some grades.

Pig Iron.—Active buying of the foundry grades continues, although the individual quantities taken have not been large. Buyers seem anxious to cover for their near future needs, some of them anticipating their requirements for the third quarter, and sales of No. 2 X foundry, in lots ranging from 100 to 500 tons, for balance of the second and third quarter, are reported at prices ranging from $16 to $16.25 delivered. Sellers, while not disposed to accept orders for large lots for delivery during the second half of the year, are not asking as heavy advances as reported earlier for such deliveries. In a number of instances $16.25 has been named for third quarter No. 2 X iron, and $16.50 for the same grade for delivery during the entire last half. For prompt shipment $16 can be comparatively freely done for standard 2 X foundry. A greater volume of business has been done in Southern iron, particularly No. 3 foundry, which has been sold for early delivery in lots ranging from 100 to 300 tons, at $11, Birmingham. The majority of sellers are now holding $11.50 Birmingham for No. 2 foundry, for early delivery, and $12 for extended shipment. The cast iron pipe interests are still in the market for some round lots of low grade irons, but these are scarce and no sales of importance have been reported. Virginia irons are being more actively sold, and prices are well maintained. A sale of several thousand tons of the higher foundry grades to the Norfolk & Western Railroad, for its Roanoke, Va., shops, is reported. Forge iron has not been active; small scattered sales are reported at $14.75 to $15, delivered, but no sizeable lots have been taken. While there has been some inquiry for basic iron, it is believed that consumers have been only feeling the market, no transactions beyond that reported last week being announced. A little inquiry for low phosphorus is heard of; a small sale for shipment outside the district has been made on the basis of $20, delivered in this vicinity. Sellers generally express a more cheerful view of the situation, and it is believed that the present movement will continue, although in many cases foundries have not shown an increase in orders commensurate with the increased buying. Most of the producers in this territory are in pretty strong position, as stocks on hand, while increasing, have not accumulated sufficiently to be a factor in the market, in a number of cases being offset by the increased tonnage booked during the month, which some sellers say is the best that they have had for a long time. Prices, while no higher for prompt deliveries, show less signs of weakness, and quotations by different sellers show a smaller range. For strictly third and fourth quarter delivery advances ranging from 25 to 50 cents a ton are being asked. For prompt delivery in buyers' yards, eastern Pennsylvania and nearby territory the following quotations are named:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.50 to 15.75
Virginia, No. 2 X foundry	16.50 to 16.75
Virginia, No. 2 plain	16.25 to 16.50
Gray forge	14.75 to 15.00
Basic	15.00 to 15.25
Low phosphorus	19.75 to 20.00

Ferromanganese.—Some little inquiry for small lots has developed from the West. Buyers in this territory, however, show no interest in the market, and quotations for 80 per cent. ferro are largely nominal, at $41.50 to $42, Baltimore.

Billets.—An improvement is noted in the demand. More inquiries are reported and consumers show a disposition to contract, but makers are not willing to take forward business at present quotations, which show a decline of $1 a ton. Sales of ordinary rolling steel, in lots ranging up to several hundred tons, for early delivery, have been made, at prices ranging from $24.50 to $25, delivered in this territory. Forging steel is quoted at $26.50 to $27, delivered, the customary extras applying.

Plates.—A larger volume of business is reported. The improved demand has been particularly for boat, bridge and tank grades, and mills have gained somewhat in tonnage booked. Shipbuilders have asked for estimates on a large tonnage, and the outlook for locomotive steel is better. Specifications on old contracts are also reported somewhat improved. Prices are unchanged, the ruling quotation for carload lots being 1.45c., delivered in this territory, the usual extras applying. For small lots better prices are realized, but concessions can also be had for desirable tonnages.

Structural Material.—Current business has been largely of a miscellaneous character. A number of good sized propositions, however, are under consideration. The Bellevue-Stratford contract for 2000 tons is still held up. Tenders for the Philadelphia & Reading Railroad elevated structure, requiring 17,000 tons, are due on the 11th inst., while several smaller inquiries, running from 200 to 500 tons, are also before the trade, and are expected to develop at an early date. Plain shapes have been fairly active, sales of moderate lots being reported at prices ranging from 1.40c. to 1.50c., according to specification, delivered in this territory.

Sheets.—There has been a somewhat better volume of business, although individual orders are still small, and mills continue to be operated on a hand to mouth policy. The bulk of the business is for spot shipment, small lots commanding full prices, but these could be shaded $1 a ton for a satisfactory order. For day to day business the following quotations for delivery in this territory are named: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—A better volume of business has developed in some directions, but the tonnages are still small and largely for immediate consumption. More business is being done in steel bars for extended delivery, running, it is said, up to the first of the year. Prices are if anything a trifle firmer, although no actual advances are reported. Refined iron bars for delivery in this territory are quoted from 1.35c. to 1.45c.; common iron bars, 1.25c. to 1.35c.; steel bars, 1.30c. to 1.35c.

Coke.—Moderate lots of foundry coke for delivery during the next few months have been sold at prices ranging from $2 to $2.25, at oven, for standard brands. The demand,

however, is not active and prices are not very strong, concessions being reported on prompt deliveries. Furnace coke continues inactive. The following range of prices is quoted for delivery in this territory:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.15 to 4.40
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.75 to 4.00

Old Material.—More inquiry is reported from consumers of heavy melting steel and prices generally are stronger. Several other specialties are in better demand, one consumer being in the market for about 1000 tons of machinery cast. The railroad lists, just out, show about an average tonnage of old material, and some buyers will probably withhold their orders until after this has been disposed of. The brokers, however, are holding their stocks in anticipation of higher prices. The tone of the market is better, and quotations, while still nominal to a large extent, range about as follows for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap	$13.75 to $14.25
Steel rails and crops	14.00 to 14.50
Low phosphorus	17.00 to 18.00
Old steel axles	17.25 to 17.75
Old iron axles	19.00 to 20.00
Old iron rails	17.00 to 17.50
Old car wheels	14.50 to 15.00
Choice No. 1 R. R. wrought	16.25 to 16.75
Machinery cast	14.50 to 15.00
Railroad malleable	13.25 to 13.75
Wrought iron pipe	14.00 to 14.50
No. 1 forge fire scrap	12.50 to 13.00
No. 2 light iron	8.50 to 9.00
Wrought turnings	10.50 to 11.00
Stove plate	12.00 to 12.50
Cast borings	9.00 to 9.50
Grate bars	12.50 to 13.00

Cincinnati.

CINCINNATI, OHIO, May 5, 1909.—(*By Telegraph.*)

There is a brighter outlook on all lines of crude and finished material, and in pig iron particularly prices have advanced for both Northern and Southern brands. In finished lines structural material has taken on new life and some nice specifications are in sight. A dinner is being given this evening at the Business Men's Club by the Bleekman interests of New York, who are negotiating for a rapid transit franchise into this city. This project looks to be a certainty, and there will be some competition, for another corporation is in the field asking for a similar franchise. New life has also been infused into the coke market, the first heavy buying of the year having occurred during the week, the supply of about 100,000 tons in one contract going to a group of Tennessee furnaces, covering the last half.

Pig Iron.—Prices on foundry iron, both Northern and Southern, have stiffened materially during the week, and the leading Southern interests are quoting on the basis of $11.50, Birmingham, for No. 2, for nearby shipment, and $12 for the last half. One large producer in southern Ohio has issued a new scale of prices based on $14.50 for No. 2, immediate delivery and over the balance of the year, withdrawing everything under that figure. One or two Southern interests which have a little piled iron would at this writing accept from old customers a moderate order for immediate shipment at $11, Birmingham, and probably take $11.25 for balance of second quarter. But the $11 iron is rapidly disappearing for nearby shipments. There has been an immense amount of iron sold through this market during the week, both Northern and Southern, and order books are so well filled for the next five months' delivery that buyers for last quarter alone are not able to get a price, although furnaces are willing to contract through the fourth quarter at $12, when third quarter iron is taken at $11.50. Inquiries are not so plentiful as it would seem, the bulk of the business accepted having been the result of offers put up to large consumers by furnace interests. The International Harvester Company is buying heavily, as is also the International Steam Pump Company. The latter is closing for needs at the Cincinnati plant 700 tons of No. 2, 500 tons silicon, 6 to 8 per cent., and 400 tons charcoal, delivery July to May; 1000 tons each of 3 to 3.5 silicon and 2.75 to 3 for last half delivery, to the East Cambridge plant, and 1000 tons each of silicon, 2.5 to 3 and 3.5 to 4, for the last half, to the Worthington plant at Harrison, N. J. The American Rolling Mill, at Middletown, purchased 6000 to 10,000 tons of basic during the week and is said to be in the market for more. The Oliver people, at South Bend, Ind., are closing to-day for 10,000 tons, Northern and Southern and charcoal iron, for the last half. An Ohio stove maker has bought 1000 tons and is said to be looking for more. There is no change in price of high silicons. Low grades are still scarce, but it is probable that forge can be bought in the South at $10.25, Birmingham. For early delivery and balance of second quarter, f.o.b. Cincinnati, the freight rate being $3.25 from Birmingham and $1.20 from Hanging Rock, we quote as follows:

Southern coke, No. 1 foundry	$15.00 to $15.50
Southern coke, No. 2 foundry	14.50 to 15.00
Southern coke, No. 3 foundry	14.00 to 14.50
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	15.00 to 15.50
Southern coke, No. 2 soft	14.50 to 15.00
Southern coke, gray forge	13.75 to 14.00
Southern mottled	13.25 to 13.75
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	22.25 to 23.25
Lake Superior car wheel	21.75 to 22.75

(*By Mail.*)

Coke.—There appears to be a wide range in prices of contract coke, as developed in sales of the past week. One agency in this district sold to furnace operators in the Southern district about 100,000 tons, covering the last half, and this transaction brought out a variety of prices for the Wise County product. Foundry coke is a little stronger, and some very good tonnages are now in negotiation on six months and a year's needs from July 1. There still appears to be some extremely low priced Connellsville furnace coke to be had and $1.50 to $1.60 at oven is heard in this connection, with contracting on a basis of $1.65 to $2, according to trade. Wise County grades range from $1.60 to $1.90 for furnace coke, on contract, and for the foundry grades the price ranges from $2 to $2.25. Pocohontas furnace coke is quoted at $1.65 to $1.75, and foundry $1.85 to $2 spot.

Structural Material.—April closed strong, with all sales agencies in this district handling structural material. It appears that some concerted movement on the part of all the largest interests has resulted in tightening the markets on structural shapes, and all representatives of these interests are insisting that the price has been restored to 1.30c., Pittsburgh. Architects are now revising specifications for the Walnut Hills Theatre, Cincinnati, which will take about 800 tons. The letting is looked for this week.

Bars.—All agencies note a good business on steel bars, and quote 1.20c., Pittsburgh, as the absolute minimum. Iron bars are quotable on the basis of 1.25c., Pittsburgh, with little business resulting.

Sheets.—The largest interest has taken a heavy volume of business in this territory, and along with other finished products on which the competitive fight was made sheets are firmer. The quoted price on one pass box annealed black sheets No. 28 is 2.20c., Pittsburgh, and galvanized of the same gauge 3.20c.

Old Material.—The dealers are experiencing a modest revival of interest in scrap, but have advanced prices cautiously to keep pace with the increased interest in iron and finished lines. There has been no movement in old steel rails, either short or long, for some time, but the latter are getting some inquiry now, and there is also some inquiry for heavy melting steel. Turnings and borings are also stronger. Dealers' prices to the trade, f.o.b. cars Cincinnati, are about as follows:

No. 1 R. R. wrought, net ton	$11.75 to $12.75
Cast borings, net ton	5.75 to 6.25
Heavy melting steel scrap, gross ton	11.75 to 12.75
Steel turnings, net ton	7.25 to 8.25
No. 1 cast scrap, net ton	11.25 to 11.75
Burnt cast, net ton	8.25 to 8.75
Old iron axles, net ton	16.50 to 17.00
Old iron rails, gross ton	14.75 to 15.75
Old steel rails, short, gross ton	12.50 to 13.00
Old steel rails, long, gross ton	12.75 to 13.25
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton	13.50 to 14.00
Low phosphorus scrap, gross ton	13.00 to 13.50

The Wage Committee of the Amalgamated Association was in session in Detroit, Mich., last week for the purpose of preparing the new wage scales for puddling and finishing mills for the year commencing July 1, and which were presented at the annual convention of the Amalgamated Association which opened in Detroit on Tuesday, May 4. Owing to the recent annulment of the continuous agreement between the Amalgamated Association and the Republic Iron & Steel Company and the Western Bar Iron Association, it will be necessary to have a settlement of the wage scales for puddling and finishing mills that sign the Amalgamated scale prior to July 1, as otherwise a shutdown on that date will be imperative.

New York Supreme Court Justice Davis has refused the application of Lewis Mareau, a minority stockholder in the Southern Steel Company, for an injunction restraining the Reorganization Committee from consummating its plan under which the assets of the company were taken over by a new concern, the Southern Iron & Steel Company, with a capital of $27,000,000.

Metal Market.

NEW YORK, May 5, 1909.

Copper.—The large shipments to Europe continue to be the topic of greatest interest in the copper trade. Last month these amounted to 28,083 tons, and so far this month aggregate 5587 tons. Not all of this is going into consumption abroad. Much is being shipped because it can be financed more easily there. Trade in Europe is not at all brisk, particularly in Germany. The largest selling interest is reported to have booked a good deal of business in the last week. This is not confirmed, and other sellers report only a little business. The price is steady, firm and unchanged, at 12.62½c., net cash to the seller, New York delivery, for electrolytic. Lake is 12.87½c. to 13c., and casting is quiet at 12.50c. The electrolytic market is firmer at the price named than in a long time. The reported rumor of a contemplated consolidation among copper producers caused little stir in speculative circles, and scarcely a ripple in the metal trade. The London market closes to-day at £57 17s. 6d. for spot, and £58 12s. 6d. for futures.

Pig Tin.—The deliveries into consumption in April, as compiled by C. Mayer, secretary of the New York Metal Exchange, were smaller than expected, being 3200 tons. The arrivals, however, were much smaller than the deliveries, amounting to only 2369 tons. These combined caused a decrease in stocks here—which could be well spared—of nearly 1000 tons. The stocks in the United States at the end of April were 2877 tons. The total visible supply for Europe and the United States at the end of last month was 18,825 tons, as against 19,208 tons at the end of March, and 13,241 tons a year ago. Trade during the week has been very quiet, and most of the transactions have been among dealers themselves. The spot supplies are largely concentrated in a few strong hands. There is no likelihood of a scarcity, artificial or otherwise, as the Minnewaska is coming in May 10 with 700 tons. The price changes during the week, owing to the statistics proving less favorable than expected, were toward lower levels, and have been as follows:

	Cents.
April 28	29.25
April 29	29.30
April 30	29.05
May 3	28.75
May 4	28.85
May 5	29.10 to 29.15

The London market closes to-day at £131 5s. for spot and £132 5s. for futures. The arrivals so far this month are 1090 tons and there are afloat for American ports 2044 tons.

Lead.—Trade is dull and prices are easier. Outside interests are willing to sell at 4.10c., St. Louis, and 4.22½c. to 4.25c., New York. The American Smelting & Refining Company continues to quote shipment lead in 50-ton lots at 4.20c.

Spelter.—Buying is very limited, and numerous complaints are heard of poor business. Prices are without change at 5.02½c. to 5.07½c., New York. In St. Louis the market is easier at 4.90c. to 4.95c.

Antimony.—Business is very quiet, but it seems probable that the increased duty will be levied on this metal because no one objects to it. Prices are unchanged at 7.75c. for Hallett's, 8.25c. to 8.50c. for Cookson's, and 7.50c. for other brands.

Tin Plate.—A good amount of business is being booked and moreover the consumption of tin plate is increasing. Prices, although unchanged, are firm at $3.64, New York, and $3.45, Pittsburgh, for 100-lb. IC coke plates. These figures are subject to the usual rebate of 5c. per box on large orders.

Aluminum.—Business is better than at the time of our last report, but consumption is still much below normal. Prices are without change at 24c. for No. 1 ingots, 32c. for rods and wire, and 34c. for sheets.

Nickel.—A fair demand is evident. Prices are without change at 45c. for 10-ton lots, and 50c. to 60c. for small quantities.

Old Metals.—Trade is very quiet. The only price changes are slight advances in lead and zinc scrap. Otherwise dealers' selling prices are unchanged from last week, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	12.00 to 12.25
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	9.00 to 9.25
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.75 to 10.00
Lead, heavy	3.90 to 4.00
Lead, tea	3.70
Zinc scrap	3.85

Reports that the Carnegie Steel Company had decided to erect a large steel car wheel plant at Universal, Pa., are untrue. No decision has yet been reached by the company as to where the plant will be located, although it will be built somewhere in the Pittsburgh District.

New York.

NEW YORK, May 5, 1909.

Pig Iron.—A very good volume of business has been done, and, notably in New England, some good sales have been made for forward delivery. Generally speaking, the larger consumers have pretty well covered into the fall, while the smaller foundries have not taken care of their requirements as fully. Prices are firmer. We quote $16.50 to $16.75 for No. 1 Northern foundry; $15.75 to $16.25 for No. 2 foundry, and $15.25 to $15.75 for No. 2 plain. Alabama iron is quoted $16.25 to $16.50 for No. 1 foundry, and $15.75 to $16 for No. 2 foundry.

Steel Rails.—The St. Paul order amounts to 60,000 tons, all Bessemer rails. Apart from this the week has developed little business. The Seaboard Air Line, which already has a portion of its requirements for 1909 under contract, is reported to be in the market for 12,000 tons of open hearth rails. Light rails are firmer and a new schedule of prices showing advances is being arranged on a basis of $26 for 40-lb. rails.

Structural Material.—The April business of nearly all the fabricating companies was very heavy. The total of contracts let, representing only business involving tonnage, such as the largest companies compete for, and leaving out much small fabrication awarded locally, was probably around 200,000 tons, of which the American Bridge Company took 70,000 tons. A good amount of work is still under consideration, chiefly in buildings, the railroads being pretty well through with contracting for bridges. The Pennsylvania inquiry for 4000 tons, chiefly viaduct work for the Sunnyside Yard on Long Island, is the chief railroad business pending, apart from the Reading contract at Philadelphia. The last considerable railroad order to be placed was that of the Gould lines, chiefly the Missouri Pacific, which amounted to 11,000 tons, taken in the past week by the McClintic-Marshall Construction Company. Deliveries are understood to extend into 1910. The Rock Island has received bids on 1700 tons. The Boston & Maine placed 700 tons with the New England Structural Company, and the Baltimore & Ohio has let bridges calling for 400 tons. Among contracts let by manufacturing companies are 700 tons for the Pittsburgh Plate Glass Company's new plant at Kokomo, Ind., taken by the Indiana Bridge Company; 600 tons for the Mitchell Motor Company, Racine, Wis., by A. Bolter's Sons, Chicago; and 350 tons for the General Electric Company's foundry at Schenectady, N. Y., by the Cambria Steel Company. The New England Structural Company took the contract for the Suffolk County Court House, Boston, 1000 tons. In New York City a number of good sized contracts are pending, including the Wolf loft building on Twenty-sixth street, 2000 tons, and several large loft and office buildings on Fourth avenue, one at Twenty-fourth street, another extending from Eighteenth to Nineteenth street, and a third from Twenty-seventh to Twenty-eighth street. Fabricators are not all convinced that the present prices on structural material will hold, and in some instances contracts have been taken for which the steel has not been placed. We quote as follows on mill shipments, tidewater delivery: Beams, channels, angles and zees, 1.41c.; tees, 1.46c. On beams 18 to 24 in. and angles over 6 in. the extra is 0.10c. Structural material, cut to lengths, is sold in small lots at 1.75c.

Old Material.—The demand from consumers is improving. Heavy melting steel scrap is wanted, but buyers are resisting the efforts of dealers to obtain a slight advance in prices. Rolling mills are now purchasing to some extent, and it is expected that as they are increasing their production they will soon be obliged to buy considerable quantities. The foundry trade is generally light, but occasionally a good sized transaction is reported in some class of foundry stock. Old car wheels are stronger, although the supply is abundant. Dealers generally regard the future with much more confidence, believing that the time is not far distant when their accumulations will have to be drawn upon to supply the wants of consumers. Quotations are as follows, per gross ton, for New York and vicinity:

Old girder and T rails for melting	$11.25 to $11.75
Heavy melting steel scrap	11.25 to 11.75
Relaying rails	19.50 to 20.00
Old iron rails	14.50 to 15.00
Standard hammered iron car axles	16.00 to 16.50
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	13.50 to 14.00
Iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	12.50 to 13.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron	6.50 to 7.00
Cast borings	6.00 to 6.50
Wrought turnings	7.50 to 8.00
Wrought pipe	10.50 to 11.00
Old car wheels	13.50 to 14.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.00 to 12.50

Bars and Plates.—The demand for bars continues to improve, and the Eastern bar iron mills are increasing their production, with some of the idle mills making preparations

to resume. Best refined bar iron is quoted at 1.40c. to 1.45c., tidewater, and steel bars are generally held at 1.36c., tidewater. The plate trade shows some improvement in sentiment, as inquiries are better, although so far no business of importance is in sight. Tank and ship plates in ordinary lots are quoted at 1.46c., tidewater, from Eastern mills.

Cast Iron Pipe.—The Eastern demand continues light. New York City is expected this week to ask for bids on about 1000 tons. Carload lots of 6-in. continue to be quoted at $23.50 per net ton, tidewater.

John J. F. Mulcahy, sales agent for the Worth Brothers Company, manufacturer of plates and boiler tubes, has removed from the Havemeyer Building to suite 2023, City Investing Building, 165 Broadway, securing considerably larger and more conveniently arranged offices.

Iron and Industrial Stocks.

NEW YORK, May 5, 1909.

The market has maintained its strength, notwithstanding some occurrences which might have been expected to exert an unfavorable influence. In some stocks new high records have been made, notably United States Steel preferred, which sold on Tuesday up to 119. The generally favorable reports of trade conditions are also causing many of the minor stocks to appreciate in value. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	15½- 16¼	Railway Spr., com.	39½- 40½
Allis-Chalm., pref..	49½- 50¾	Railway Spr., pref.	101 -101¼
Beth. Steel, com..	23 - 24½	Republic, com.....	24¼- 25½
Beth. Steel, pref..	51⅞- 55	Republic, pref....	80 - 85¼
Can, com.....	10 - 10⅞	Sloss, com.....	77 - 79
Can, pref.....	78½- 79¾	Pipe, com.....	31¼- 31¾
Car & Fdry, com..	50¾- 52	Pipe, pref.....	75 - 76¼
Car & Fdry, pref..	112½-113½	U. S. Steel, com...	54⅛- 56⅝
Steel Foundries...	37 - 39½	U. S. Steel, pref...	115 -119
Colorado Fuel.....	38½- 40⅝	Westinghouse Elec.	82 - 83⅞
General Electric...	157⅝-160¼	Am. Ship., com.....	55
Gr. N. ore cert....	68½- 69½	Chi. Pneu. Tool...	21 - 22½
Int. Harv., com...	82 - 83	Cambria Steel.....	37 - 38
Int. Harv., pref...	119 -120¾	Lake Sup. Corp....	28 - 29¾
Locomotive, com...	55¾- 56¾	Penna. Steel, com.	- -
Locomotive, pref..	114¼-115⅝	Penna. Steel, pref.	104 -105
Nat. En. & St.,com.	13⅜- 14	Warwick	8 - 8⅛
Pressed St., com...	38 - 40¼	Crucible St., com..	7⅝- 7½
Pressed St., pref..	100¾-102	Crucible St., pref..	59⅞- 61½

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 55⅞, preferred 119⅝, bonds 104¼; Car & Foundry common 52½, preferred 113¾; Locomotive common 57⅜, preferred 116; Colorado Fuel 39¼; Pressed Steel common 40¾, preferred 101¼, ex-dividend; Railway Spring common 40½; Republic common 25, preferred 84¼; Sloss-Sheffield common 78¾; Cast Iron Pipe common 31½, preferred 75½; Can common 10⅛, preferred 79⅛.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, furnish the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926....	..	85
Bethlehem Steel purchase money 6s, August, 1998. ..		118½
Buffalo Iron 5s, October, 1925.....100		..
Buffalo & Susquehanna Iron 1st 5s, June, 1932....	99	..
Buffalo & Susquehanna Iron deb. 5s, January, 1926.	99	..
Dominion Iron & Steel 5s, July, 1929.....	92	..
La Belle Iron 1st 6s, December, 1923.....104		106
Lackawanna Steel 1st 5s, April, 1923.....	93	..
Maryland Steel 1st 5s, February, 1922.....100		..
Penn Steel 1st 5s, November, 1917.....100		..
Pennsylvania & Maryland Steel 6s, September, 1925.109		..
Republic Iron & Steel 1st 5s, October, 1934.....	98⅞	99½
Sloss Iron & Steel 1st 6s, February, 1920.....104½		108
Sloss Iron & Steel consol. 4½s, April, 1918.....	94½	97
Jones & Laughlin 1st 5s, May, 1939.....	99⅜	99⅝
United States Steel Corporation.		
Collateral Trust 5s, Series A, C, E, April, 1951....114½		115½
Collateral Trust 5s, Series B, D, F, April, 1951....114½		115½
Sinking Fund 5s, April, 1963.....104		104¼
Union Steel 1st 5s, December, 1952.....104⅜		104⅞
Clairton Steel 5s, 1908-1913.....100		..
St. Clair Furnace 1st 5s, 1910-1939.....100		..
St. Clair Steel 1st 5s, 1908-1926.....100		..
Illinois Steel Company deb. 5s, January, 1910.....100¼		..
Illinois Steel Company 5s, April 1, 1913.....100⅝		101⅛

All bonds quoted "and interest."

Dividends.—The Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable May 26.

B. Nicoll & Co. Extend Their Coal Connections.—The arrangement under which the seven Pittsburgh gas coal mines on the West Side Belt Railroad have been operated by the Pittsburgh Coal Company under lease for the past five years has been terminated, and these mines will in the future be operated by their owner, the Pittsburgh Terminal Railroad & Coal Company, controlled by the Gould interests. B. F. Bush of Baltimore has succeeded F. A. Delano as president of the Pittsburgh Terminal Railroad & Coal Company and will operate the mines. The operating department will be in charge of W. W. Keefer, formerly general superintendent of the Pittsburgh Coal Company, and at present manager of mines of the Monongahela River Consolidated Coal & Coke Company. B. Nicoll & Co., Singer Building, New York, who are well known in the iron, coal and coke trades of the country, will be the general sales agents of the company. They will have a branch office on the fifth floor of the Wabash Building in Pittsburgh. The minimum capacity of the mines is 2,000,000 tons annually, the coal, which is well known as a superior gas coal, being marketed both East and West.

Gerlach Barrel Machinery for Mexico.—The Peter Gerlach Company, Cleveland, Ohio, recently executed a Mexican order for two carloads of stave heading and barrel machinery amounting to $10,000. Shipment was made in the past week. The contract was given by a company controlling the pulque supply of Mexico under government protection. It is building a modern barrel plant at Mexico City for the manufacture of white oak barrels as containers for the well-known Mexican drink. The Peter Gerlach Company received the above contract in competition with English, German and American manufacturers of barrel machinery. The Westinghouse interests have the order for the electrical equipment, each machine being driven by a motor. The Cleveland company has put on the market three new machines—a universal stave jointer, the Apollo stave planer and an automatic stave crozer. The use of such equipment in barrel factories permits of the product being shipped in knock-down form, with considerable saving in freight charges and prevention of timber waste in the jointing of staves.

The Phillips Sheet & Tin Plate Company.—This company, now operating a 12 hot mill tin plant at Clarksburg, W. Va., has decided to erect another tin plate mill at Holliday's Cove, W. Va., on the Ohio River, about 4 miles above Steubenville. A tract of about 100 acres of land has been bought for the purpose. It has not been fully decided whether the plant will contain 8 or 12 hot mills, but it will probably be an 8-mill plant at the start. Contracts have been let for the foundation, cement and brick work, and the buildings, mills and other equipment will be let early next week. The plant is being built mainly to make specialties in tin plate under processes owned by the company. Its erection will make the Phillips Sheet & Tin Plate Company the largest independent concern in the country in its line.

Correction.—Through a typographical error the force of a statement was weakened, which was made in the article on "The Railroad Tie Question," printed on page 1356 of *The Iron Age* of April 29. In the last line of the third paragraph from the end the aggregate saved should have been printed "$1,987,986,000" instead of "$1,987,986."

W. N. Kratzer & Co., Pittsburgh, have the contract for furnishing and fabricating the structural steel required for the new Temple Theater at Rochester, N. Y., 600 tons, in which are included two steel plate riveted box girders of unusual size and tonnage, one each to support the balcony and gallery. These girders are each 22 in. in width, 22½ in. in depth and 84 ft. in length, weighing 39 tons each. Shipments have been going forward on this work for some time. One of the girders is said to have been the largest single load ever hauled through Pittsburgh streets.

Muralt & Co., engineers, 114 Liberty street, New York, have opened a branch office in the Temple Court Building, Bay and Richmond streets, Toronto, Canada. J. Engh, who has been connected with the firm for many years, will be in charge as manager.

It is understood that the Jones & Laughlin Steel Company will build a 30-mill tin plate plant at Aliquippa, Pa.

PERSONAL.

Matthew R. Moore, formerly superintendent of the Atlas Engine Works, Indianapolis, Ind., is now connected with the Frost Mfg. Company, Galesburg, Ill., in like capacity.

Andrew Carnegie sailed for Europe April 29, expecting to return in the fall.

Philo Kennery, for a number of years chemist with the Crescent Steel Company, Pittsburgh, Pa., has recently been appointed metallurgical engineer of the company.

C. E. Pettee, who was formerly with the Westinghouse Machine & Tool Company, is now works manager of the Herman Pneumatic Machine Company, Zelienople, Pa.

Edwin J. Haddock has resigned his position as chief engineer of the Jeffrey Mfg. Company, Columbus, Ohio, to engage in business for himself in that city as mechanical, structural and mill engineer.

Forbes H. Eaton, until recently purchasing agent of the Scranton Steam Pump Company, Scranton, Pa., is now connected with the Connellsville Machine & Car Company, Connellsville, Pa., as general manager.

Sir W. Thomas Lewis, the president-elect of the Iron and Steel Institute, having resigned, Sir Hugh Bell has consented to continue in the presidency for a further term of 12 months.

J. H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia; H. W. Hoyt, Great Lakes Engineering Works, Chicago, and P. B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y., have been named by President H. P. Eells of the National Metal Trades Association as the Executive Committee of the Administrative Council.

W. S. Rogers, president of the Bantam Anti-Friction Company, Bantam, Conn., sailed for Germany April 29 on the invitation of several German makers of balls and ball bearings, to make close connections for the handling of their goods in this country. This means that the Bantam Anti-Friction Company will enter the automobile field with an energy that those knowing Mr. Rogers can appreciate.

Sir Robert Hadfield of Sheffield is now in this country.

The Elliott Cresson gold medal has been awarded by the Franklin Institute of Philadelphia to James Gayley of New York for his invention of the dry blast.

P. Broglio, technical director for A. G. Duesseldorfer Roehrenindustrie, a large merchant pipe manufactory at Duesseldorf, Germany, who has been visiting manufacturers in this country, sailed for Europe April 29.

C. P. March, president of the Cincinnati Shaper Company, who has been spending several months in Europe, returned last week.

William Horsley will sever his connection with the Bigelow Company, New Haven, Conn., June 1 to take charge of the Eastern warehouse and plant of the Scully Steel & Iron Company at Jersey City, N. J., where the Horsley pressed steel boiler nozzles will be manufactured.

A. A. Buehring, connected with the New York office of the Dodge Mfg. Company in the capacity of engineer and salesman, sailed for Europe May 5 to look after some interests of the company on the Continent. He expects to be away for about four months.

Alfred M. Mosscrop, who went to Middlesbrough, England, six years ago to take up the management of the Britannia Works of Dormans, Long & Co., and who has recently acted as one of the managing directors, has decided to return to the United States on account of ill health.

C. J. Morgan, vice-president of the Taylor & Boggis Foundry Company, Cleveland, returned home April 29 from a two months' pleasure trip to Mexico and California.

George D. Evans, for several years with the sales department of the Republic Iron & Steel Company, has recovered from the ill health that caused him to resign about a year ago as assistant sales manager of the Cleveland office of that company, and has accepted a position with the Denver office of the United States Steel Corporation.

The repair shop of the Crocker-Wheeler Company, Ampere, N. J., has been placed in charge of Edmund Lang, who for five years held an executive position with the Wheeler Condenser & Engineering Company.

Charles M. Schwab of the Bethlehem Steel Corporation sailed for Europe Tuesday.

Walter B. Snow, publicity engineer, 170 Summer street, Boston, Mass., announces the association with his staff of Carl S. Dow, late publicity manager of the B. F. Sturtevant Company and formerly in charge of instruction and textbook departments of the American School of Correspondence.

Charles E. Sedgwick, formerly connected with the sales department of the Ft. Wayne Electric Works, has taken a responsible position with the Portland Machine Company, Portland, Ore.

John Craig has succeeded J. W. Birmingham as office manager at the New Castle, Ind., plant of the Maxwell-Briscoe Company. He formerly held a similar position with the Canada Foundry Company, Toronto, Canada, and carries a costly watch presented him on the occasion of his departure thence March 31. Mr. Birmingham goes to the Tarrytown, N. Y., plant of the Maxwell-Briscoe Company.

James Lippincott, secretary of the West Leechburg Steel Company, Pittsburgh, has assumed the duties of F. R. Kenyon, vice-president and general manager of the company, who recently resigned.

Joseph Schonthal, Columbus, Ohio, has been made president of the West Virginia Rail Company, operating a plant at Huntington, W. Va., which rolls light rails from old rails.

The Engineers' Club, recently organized at Youngstown, Ohio, has organized by electing the following officials: William Wilson, president; H. L. Patterson, vice-president; R. N. Colborn, secretary; John Hunter, treasurer; trustees, Ett Smith, E. H. Beil and Eugene Kirk.

Ernst Koerting of the well-known firm of builders of gas engines, Gebr. Koerting Aktiengesellschaft, Hanover, Germany, is now in this country.

Among those who have sailed for Europe during the past few days are J. A. Hatfield, president of the American Bridge Company, and James Gayley of New York.

G. A. Prendergast, formerly assistant to the New York sales agent of the Cambria Steel Company, has severed that connection and is devoting his time to the Wemlinger Steel Piling Company, 11 Broadway, New York, of which he is treasurer.

The Purest Iron Ore.—Witherbee, Sherman & Co., Port Henry, N. Y., have from time to time produced considerable quantities of a specially prepared Harmony ore. Until now the highest in iron has been 71.20 per cent. The latest shipment, recently made, has beaten the record, the analysis showing 71.35 per cent. of iron and 0.022 per cent. of phosphorus. This is believed to be the highest analysis of iron ore sold for commercial purposes ever known. In these days, when the general trend of the metallic contents of ore is rather downward, it is interesting to note that magnetic separation can produce ores of extraordinary richness.

Corrigan, McKinney & Co. have awarded the contract for the smaller engines for their new blast furnace in Cleveland to the Ball Engine Company, Erie, Pa. There will be two 400-hp. engines and one 800-hp. The contract for the blowing engines has been let to the Wisconsin Engine Company, Corliss, Wis.

Thyssen & Co., owners of the Deutscher Kaiser, Bruckhausen, Rhein, the largest rail mill in Germany, have decided to put up two Heroult electric furnaces for refining the rail steel produced by their basic Bessemer converters.

OBITUARY.

WILLIAM E. MILLER, prominent in the steel and stone industry in Ohio, died suddenly at his home in Elyria, Ohio, April 27, of heart disease, aged 70 years. He opened the Grafton stone quarries, which were taken over by the Cleveland Stone Company, of which he was one of the organizers and a heavy stockholder. After retiring from active interest in the stone business he became president of the Shelby Tube Company. Following the sale of this company's plant to the United States Steel Corporation he went to Elyria, Ohio, and formed the Elyria Iron & Steel Company, of which he has retained a controlling interest, his son, W. Stacy Miller, being president of the company and active manager of the business.

THOMAS ALDRIDGE WESTON died in St. Luke's Hospital, New York, May 3, aged 77 years. He was born in Birmingham, England. His name as inventor and mechanical engineer will always be associated particularly with his pulley blocks, especially differential pulley blocks, but he devised many practical improvements in other lines. Weston pulley blocks were manufactured under license in England by Tangye Bros. and in this country by the Yale & Towne Mfg. Company, Stamford, Conn., and more recently by the Brown Hoisting Machinery Company, Cleveland, Ohio. Mr. Weston was for many years associated with the Yale & Towne Company as mechanical engineer.

Largest Ore Freighter Launched.—On May 1 the new ore boat Shenango was launched at the Ecorse yards of the Great Lakes Engineering Works, at Detroit, Mich. The Shenango has the distinction of being the largest ore carrying vessel afloat, its capacity being 13,000 tons of ore or coal, or 488,000 bushels of wheat, representing an average crop from 19,000 acres. Its length over all is 607 ft.; beam, 58 ft., depth, 32 ft., and it contains 36 hatches. The boat is equipped with one vertical triple expansion engine, two Scotch type boilers, built for 170 lb. working pressure, and a complete electric lighting plant, with two 15-kw. direct connected marine type generating sets of about 250 16-cp. capacity each. Accommodations for guests comprise nine staterooms, with shower baths in each room; a grillroom forward, with electric cooking appliances, and other special equipment for their entertainment. Nearly 6600 tons of plates and shapes were used in the building of the boat, all furnished by the Jones & Laughlin Steel Company, Pittsburgh. It is expected to be ready for commission about June 15 and will haul ore from Duluth to lower lake ports for the blast furnaces of the Shenango Furnace Company, Sharpsville, Pa. This makes a total of three boats owned by identified interests of the Shenango Furnace Company, two of which, the W. P. Snyder and the Wilpen, are owned by the Shenango Steamship Company, while the Shenango is owned by the Shenango Steamship & Transportation Company, recently organized with a capital of $10,000. W. P. Snyder, president of all these interests, took a party of friends from Pittsburgh to Detroit to witness the launching of the new boat.

A new 1600-barrel Portland cement plant is being built at El Paso, Texas, by the Southwestern Portland Cement Company. The plant is located about 1 mile from the city limits on a tract of 900 acres containing deposits of material from which the cement is to be manufactured. All of the buildings, including storage bins and circular storage tanks for raw material, clinkers and finished cement, are to be of reinforced concrete. Ball mills will be used for preparing the clinker for the fuller mills. All machines will be driven by independent motors, direct connected where possible, from current supplied by a power plant containing two 750-kw. generators direct connected to Westinghouse-Parson turbines. Sterling boilers supplied with mechanical stokers will be used. The plant is to be completed by October, and the brand of the cement will be El Toro.

Foundry Equipment Exhibit at Cincinnati.

It is announced by C. E. Hoyt, secretary of the Foundry and Manufacturers' Supply Association, that the exhibit of melting furnaces in connection with the convention of the American Foundrymen's Association at Cincinnati, May 17-22, will be the most complete yet made. The temporary building for this exhibit, which will adjoin Music Hall, the location of the general exhibit, will be ready for occupancy May 7. The following firms have arranged to make exhibits at the convention:

Arcade Mfg. Company, Freeport, Ill.
Baird & West, Detroit, Mich.
Oscar Barnett Foundry Company, Newark, N. J.
Jonathan Bartley Crucible Company, Trenton, N. J.
Berkshire Mfg. Company, Cleveland, Ohio.
S. Birkenstein & Sons, Chicago, Ill.
Brown Specialty Machinery Company, Chicago, Ill.
A. Buch's Sons Company, Elizabethtown, Pa.
Burroughs Adding Machine Company, Detroit, Mich.
Calumet Engineering Works, Harvey, Ill.
Canadian Machinery, Toronto, Ont.
Carborundum Company, Niagara Falls, N. Y.
Castings, Cleveland, Ohio.
Cleveland Wire Spring Company, Cleveland, Ohio.
Geo. F. Crivel Company, Buffalo, N. Y.
Curtis Mfg. Company, St. Louis, Mo.
Detroit Foundry Supply Company, Detroit, Mich.
Detroit Testing Laboratory, Detroit, Mich.
Diamond Clamp & Flask Company, Richmond, Ind.
Dixon Crucible Company, Jersey City, N. J.
Stanley Doggett, New York City.
Falls Rivet & Machine Company, Cuyahoga Falls, Ohio.
Foundry, Cleveland, Ohio.
Foundry Specialty Company, Cincinnati, Ohio.
Goldschmidt-Thermit Company, New York City.
R. F. Goyne, New York City.
Hauck Mfg. Company, Brooklyn, N. Y.
Hawley Down Draft Furnace Company, Chicago, Ill
Herman Pneumatic Machine Company, Zelienople, Pa.
Hickman-Williams Company, Cincinnati, Ohio.
Hill & Griffith Company, Cincinnati, Ohio.
Holland Linseed Oil Company, Chicago, Ill.
E. Killing's Molding Machine Works, Davenport, Iowa.
Kroeschell Bros. Company, Chicago, Ill.
Manufacturers' Equipment Company, Chicago, Ill.
Walter Macleod & Co., Cincinnati, Ohio.
J. S. McCormick & Co., Pittsburgh, Pa.
Millers Products Company, Chicago, Ill.
Monarch Engineering & Mfg. Company, Baltimore, Md.
Newport Sand Bank Company, Newport, Ky.
S. Obermayer & Co., Cincinnati, Ohio.
Oliver Machinery Company, Grand Rapids, Mich.
Osborn Mfg. Company, Cleveland, Ohio.
J. W. Paxson & Co., Philadelphia, Pa.
Pickands, Brown & Co., Chicago, Ill.
H. E. Pridmore, Chicago, Ill.
Robeson Process Company, Au Sable Forks, N. Y.
Rockwell Furnace Company, New York.
Sand Mixing Machine Company, New York.
Wm. Sellers & Co., Inc., Philadelphia, Pa.
W. W. Sly Mfg. Company, Cleveland, Ohio.
J. D. Smith Foundry Supply Company, Cleveland, Ohio.
Ed. E. Squier Company, St. Louis, Mo.
Standard Sand & Machine Company, Cleveland, Ohio.
Sterling Wheelbarrow Company, Milwaukee, Wis.
Tabor Mfg. Company, Philadelphia, Pa.
Whiting Foundry Equipment Company, Harvey, Ill.
E. H. Mumford Company, Philadelphia, Pa.
Mount Carbon Company, Powellton, W. Va.
Gulick-Henderson Company, Philadelphia, Pa.

Secretary Hoyt is now at the Hotel Linton, Cincinnati, and will be there until after the convention. Fifteen firms have been added recently to the membership of the Foundry and Manufacturers' Supply Association.

David Townsend, mechanical and consulting engineer, Philadelphia, Pa., read a paper before the mechanical section of the Franklin Institute in that city on the evening of April 29, on "Prevention of Smoke." He recommended the purchase of coal and coke on an analysis basis and according to their value in British thermal units. He also referred to various smoke consuming devices, and described in particular that of the Cornell Economizer Company, Philadelphia, Pa.

The Brooks plant of the American Locomotive Company, Dunkirk, N. Y., last week received a supplemental order from the New York Central Railroad for 13 switch engines, making a total of 31 locomotives for New York Central lines placed with the Dunkirk plant for June and July delivery.

The Machinery Trade.

NEW YORK, May 5, 1909.

Business the past week was not quite as brisk as it was earlier in April, the slight falling off in sales being attributed to a greater tendency to hold off from making purchases after bids have been received. Merchants say that they get to the point of closing a sale when the customer decides to wait a while before signing the order. In most cases, it is thought, the customer wants to await a further improvement in his business. Some machinery houses report that they have sufficient business being held up, that is promised them, to make a good volume. Inquiries appear to be quite numerous, but they are still of the smaller size and slow in closing. No further encouragement has been received from the railroads or the large industrial projects that have been brought forward, but in view of the optimistic feeling that any turn will be toward a betterment, it is thought that from these sources considerable business will be received in the near future. In other sections of the country companies are reported to be buying more freely, but few houses in this territory are in a position to benefit from this activity. The Chicago, Milwaukee & St. Paul Railroad has issued a fair sized tool list. The demand for milling machines has been so good that one Western builder is not able to make deliveries inside of six or eight weeks, and some business has been lost by dealers here on that account. Business received in April was not quite equal to that for March, which was somewhat surprising, as the opening of the month indicated a substantial betterment.

Large Southern Structural Steel Plant.

One of the largest structural steel and bridge plants in the South will be erected at Memphis, Tenn., by the Virginia Bridge & Iron Company, Roanoke, Va., which has purchased 11 acres of ground in the former city from the Southern Land & Improvement Company. The deal for the land was closed by C. Edwin Michael, president of the company, and work of constructing the plant will be started as soon as possible with the intention of having the buildings ready for occupancy by September 1. The plant will cost, independent of the purchase price of the site, over $150,000, and will give employment at the start to about 300 men. It will be situated between the Illinois Central, Louisville & Nashville, Chattanooga & St. Louis and the Southern Belt railroads, and the buildings will be fireproof, constructed of steel, which is now ready to ship from the company's plant at Roanoke. The plant will cover the entire 11 acres of ground, and will have a capacity of about 12,000 tons. An extensive trackage and convenient situation will enable the company to make quick shipments to Tennessee, Mississippi, Louisiana, Texas, Arkansas and Oklahoma, saving in some instances 1000 miles of transportation, as compared with the distance from the present plant. Robert J. Maybin will be district manager for the Memphis plant, and will be there in time to superintend the construction of it and to look after the company's other business, which has grown considerably in the Central West the past two years. The company is also to erect a $50,000 plant for structural steel and bridge work at Atlanta, Ga., and ground has already been broken for the foundations for the new buildings. The structural steel for these shops is about to be shipped, and within the next 30 days work of construction will start. The plant will employ about 50 or 60 men, and will be under the management of Jules W. Leroux, district manager; J. M. Muhs, resident engineer, and R. H. Kelly, chief clerk. Mr. Leroux has been manager of the Atlanta office of the company for several years. The first work at the plant will be the structural steel for the extension of the Piedmont Hotel. The machinery for this plant has been secured. Both of the new plants will be modern in every respect, and all the machinery installed will be of the latest pattern. The Virginia Bridge & Iron Company, which started in a small way at Roanoke some time ago, in two years doubled and trebled its capacity, and now has an extensive plant there. It is getting a great deal of work from the railroads, which it will execute at Memphis, and hopes to be able to double the capacity of the new plant in that city within a year or two.

A large quantity of mining machinery is to be purchased by the Georgia Steel Company, Atlanta, Ga., a subsidiary of the Southern Steel & Iron Company, which is the reorganization of the Southern Steel Company. At a recent meeting the Reorganization Committee authorized the expenditure of $250,000 for developing the brown iron ore properties of the Georgia Steel Company in Bartow, Cherokee and Polk counties, and for increasing the mining equipment. A large part of this sum will be used in the purchase of new machinery, including a new ore washer. It is the intention to bring these properties up to date, so that the ore can be mined as economically as is possible, and it is hoped to have the mines in operation by September 1. The Southern Steel & Iron Company also contemplates making improvements to its properties in Alabama and Tennessee. At the Atlanta meeting D. G. Boissevain of Keene, Van Courtlandt & Co., New York, was elected president of the Georgia Steel Company, and John D. Little of Atlanta, vice-president. The new Board of Directors include these officers and Joel Hunt, J. Carroll Payne, Winfield Jones and Alexander Chambliss.

The Covert Motor Vehicle Company, B. V. Covert, president and general manager, Lockport, N. Y., has purchased a site on which is located a three-story building, 24 x 60 ft., and is having plans prepared for an additional building, three stories, 50 x 150 ft., of brick and steel or re-enforced concrete construction, and will move its present plant, which is now located in leased quarters, to the new site on completion of the additional building. The company is engaged in the manufacture of automobile parts, including rear axles, levers and transmission equipment. The machinery located at the present plant will be moved to the new location, and in addition the company will be in the market for four or five milling machines, 10 lathes, ranging from 18 to 24 in.; five screw machines, 1½ to 3-in. spindle; three grinding machines, four or five gear cutting machines, clutches, pulleys, hangers, shafting, belting, &c. The plant is to be equipped with motor drive, the machines being grouped to line shafts.

The Douglas Foundry & Machine Works, Douglas, Ga., is erecting a new shop, 50 x 100 ft., in which it will later install planers, lathes, a steam hammer and other machines.

F. W. Lorraine of Beaver Falls, Pa., is inquiring for crushing, elevating and conveying machinery. He also desires catalogues and information on coal and ore washing machinery.

John Du Roth of Johnstown, Pa., who some time ago purchased about 20 acres of ground and the abandoned buildings of the Cambria Powder Company, at Seward, Pa., which company was absorbed by the Du Pont Powder Company, has with other prominent men of Johnstown and Seward organized the Du Roth Mfg. Company, with a capital stock of $50,000. On the site the company will erect a new plant to consists of a machine shop, foundry and other buildings for the manufacture of car wheels and mine and railroad supplies under patents held by Mr. Du Roth. One of the products will be a car truck without axles, each wheel being independent of itself, which has undergone satisfactory tests. John Du Roth is president and George Fockler secretary and treasurer.

Considerable new machinery will likely be purchased by the Automatic Transportation Company, Buffalo, N. Y., manufacturer of aerial railroad material for transporting light freight and express matter. The company has let contracts for an addition to its plant at Main street and the Erie Railroad, 50 x 150 ft., two stories, of brick construction, which will be equipped with modern iron working machinery, including lathes, drill presses, planers, shapers, punches, bulldozers and machinery of special design. The company expects to be able to occupy its new shop about August 1. It reports a good demand for its products.

Business Changes.

M. E. Dewstoe, First National Bank Building, Birmingham, Ala., who was recently appointed selling agent for the Bullard Machine Company, Bridgeport, Conn., has also been appointed selling representative in Alabama and Tennessee by the following well-known machine tool builders: Cincinnati Milling Machine Company, Lodge & Shipley Machine Company, Cincinnati Bickford Tool Company, Cincinnati Planer Company, Cincinnati, Ohio; Gould & Eberhardt, Newark, N. J.; Foote-Burt Company, Warner & Swasey Company, Lucas Machine Tool Company, Cleveland Planer Works, Cleveland, Ohio; Stoever Foundry & Mfg. Company and Lea Equipment Company, New York; West Tire Setter Company, Rochester, N. Y.; New Doty Mfg. Company, Jaynesville, Wis.; Charles F. Elmes Engineering Works, Chicago, Ill., and the Heald Machine Company, Worcester, Mass. Mr. Dewstoe also carries a full line of emery grinders, chucks, electric drills, grinders, &c. Although he has just started in business as a manufacturers' agent, he has worked the trade in the Southern States for some years and has been for a long time in the machine tool business.

Chicago Machinery Market.

CHICAGO, ILL., May 4, 1909.

Business in machinery lines is steadily improving, not rapidly it is true, but enough to show that the movement is in the right direction. Reports from the various machinery interests are more encouraging, in that they are growing somewhat more uniform both as respects actual sales and prospective orders. This naturally indicates a wider distribution of business, which can only come in a marked degree through an increase in volume. While the orders being entered by the machine tool houses continue to be supplied largely from the smaller manufacturing industries, they are growing more numerous; inquiries from the

larger shops are also coming out more freely, a fact that is regarded as foreshadowing the existence of important requirements that are likely to come into the market later on. The demand for millers and grinders is relatively good, due largely to the exceptional activity observed in the automobile industry. In last week's sales of one of the leading machine tool houses were included 12 millers of various sizes, the majority of them going to augment the equipment of automobile shops. Good second-hand tools are in even better demand than new ones, and within the past few days quite a number of planers and shapers have been moved. The reappearance of some inquiries for equipment withdrawn from the market some months ago is significant of renewed interest, and dealers are of the opinion that purchases will now be made without further delay. One of these, embracing requirements amounting to $7000, on which bids have already been twice submitted, is from an interest closely allied to the railroads, and is, therefore, regarded as a hopeful sign in that direction. Although the railroads themselves are not buying anything to speak of, they are making inquiries that are interpreted as forerunners of purchases contemplated early in the second half of the year.

Chicago, Milwaukee & St. Paul Railroad's Machinery Requirements.

The Chicago, Milwaukee & St. Paul Railroad has issued the following list of tools upon which figures are being taken. Figures have previously been submitted on most of these tools, they having been included in former lists, but not purchased: These requirements will amount to about $35,000. One double punch and shear, with 36-in. throat, to punch 1¾-in. hole in 1⅛-in. iron, with a capacity for shearing 2¼-in. round iron, motor driven; one 84-in. guide bar grinder, one 48-in. x 16-ft. planer, with two heads, and power cross feeds, motor driven; one 36-in. instantaneous change gear lathe; one 4-jawed, 24-in. diameter, chuck for above lathe; one 72-in. vertical boring and turning mill, with two heads on cross rail, belt driven; one flue welder, one boiler flue furnace, one 1600-lb. single frame hammer, one 2½-in. heating and forging machine, with capacity for stock up to 2½-in.; one single bolt and bar shear to cut 1¾-in. round and 10-in. flat iron; one No. 9 steel pressure blower, motor driven; one 100-lb. rubber cushioned hammer, belt driven; one single punch, with 42-in. throat, capacity 1-in. hole in ¾-in. plate; two wet emery wheel grinders; one locomotive cylinder boring bar to bore 14-in. to 42-in. diameter by 32-in. stroke; one 52-in. heavy car wheel boring machine, five jaws; one 18-in. slotting machine, one ½-in. six spindle nut tapping machine, one No. 4 independent feed four spindle drill, one universal milling machine for tool room, one 6-ft. full universal radial drill press, one heavy double axle lathe, one 42-in. steel tired car wheel lathe for turning or trueing two car wheels, 42-in. or smaller, without removing from axle; one power plate bending roll for bending ½-in. boiler plate; one 6-spindle mud ring and flue sheet drill, having an in and out motion of 24 in. and 12 ft. 4 in. between housings; one 30-in. turret head boring and turning mill; one 3 x 36-in. flat turret lathe, for working material ⅜-in. to 2-in.; one 1½-in. double staybolt cutter.

In line with the remarkable activity noted in automobile building, is the announcement that the Reo Motor Car Company, Lansing, Mich., expects during the coming summer to expend $250,000 for plant extensions and improvements. One of the main ships will be raised from two to three stories in hight, and another new building will be erected; these when completed will add about 80,000 sq. ft. of floor space to that of the present plant. To provide for these enlargements and to take care of its constantly increasing business, the capital stock has recently been increased $1,000,000. The company is at present turning out about 50 machines a day, and expects to ship not less than 6500 during the season.

The Fox Machine Company, Grand Rapids, Mich., reports encouraging improvement over the corresponding months of last year. Since the first of January the business of one or two months has reached an almost normal level, and the shop is now running on full time. The company is developing its lines, and expects in the near future to bring out two new tools.

The Lansing-Cobalt Mining Company, Ltd., with offices at Windsor, Ont., and Lansing, Mich., has decided to purchase a steam hoist outfit, air compressor and two air drills for the purpose of sinking a shaft on its property.

Plans for the development of the Arizona Central Copper Company, Humboldt, Ariz., contemplate the purchase of an electrically driven hoist, air compressor, rock drills and pump, together with an electric lighting system for the camp and mines. Current will be furnished by the Arizona Power Company, which, however, will not be ready to furnish power before August 1.

Negotiations are under way for the organization of a company to be known as the Detroit Bridge & Steel Works, Detroit, Mich. A site for the proposed plant covering 7½ acres on Dearborn road, adjacent to the Michigan Central tracks, has been secured for the erection of the plant, and plans for the machinery equipment are being drawn.

The Frost Mfg. Company, Galesburg, Ill., builder of engines, has recently enlarged its capacity by the installation of new machinery, including molding machines for the foundry and machine tools in the machine and boiler shops. That there is better demand for motive power equipment, especially in small units, is indicated by the statement that its business shows considerable improvement over the same period a year ago. In the Southwest especially the demand has notably increased.

Peter Theon contemplates the establishment of a machine shop at Lanesboro, Minn., which will probably be ready for business in September. He is now negotiating for the machinery equipment.

The Advance Tool & Machine Company, 203-207 South Canal street, Chicago, expects to enlarge its equipment by the purchase of a few tools adapted to the manufacture of dating stamps, which has been added to its line of dies and tools.

Upon the completion of the electric power line from Fossil Creek, the Stoddard Copper Company, Phœnix, Ariz., contemplates the installation of electric machinery in its mines at Stoddard. Current for its operation, however, will not likely be available before fall.

Forced to seek new quarters by reason of the overcrowded condition of their machine tool, store and warehouse rooms at 143-147 South Clinton street, Chicago, A. O. Walworth & Co., will soon move to 103 South Clinton street, where they will occupy the main floor and basement.

The Ernst Wiener Company, New York, manufacturer of industrial cars and track, has appointed the W. K. Kenly Company, Chicago, Ill., as its district sales agent.

Milwaukee Machinery Market.

MILWAUKEE, WIS., May 4, 1909.

For the past week local industrial conditions have been marked by further improvement. Machine tool builders, both in Milwaukee and throughout the State, report an increase in business actually closed, and inquiries are assuming more of a dependable character. A feature of increasing importance is the demand for apparatus with which to equip repair shops operated in connection with large industrial plants, smelters, mines, saw mills, &c. Railroads are also improving the facilities for work at round houses, yards and junction groups maintained along the outlying divisions, where equipment has been allowed to get rather run down; and electric, traction lines, particularly of the Central West, seem to be planning extensive additions to machinery of every kind used in connection with interurban systems. Sales of prime movers, electric generators, motors, controllers, pumps, boilers, feed water heaters, hoisting mechanisms, air compressors, hydraulic presses and power transmitting apparatus of various types continue active; while machinery, tools and materials used in construction work show a steady gain. Many of the local plants are either operating full time, with nearly normal force, or are on the point of doing so, and confidence in the essential stability of the present upward movement is becoming widely diffused. Letters received by a central association from manufacturers in every part of Wisconsin, as well as some in adjacent States, are almost uniformly encouraging in tone. All indicate belief in a large fall trade, and many tell of preparations now being made, as partly described by last week's report, to meet the opportunities of the immediate future. Whatever may be the situation elsewhere, the call here is "vorwaerts!"

The Brillion Iron Works writes a Milwaukee correspondent that, owing to the number of orders taken for crushers, its plant at Brillion, Wis., which was enlarged last fall, is still too small. Another extension will probably be made this summer. This year promises to be the largest in the history of the company, which also operates a custom foundry and general machine shop.

With the new plant for the manufacture of concrete mixers in operation, the Chain Belt Company, Milwaukee, Wis., finds its power facilities inadequate. A gas engine and generator may be installed this year.

An indication of improved industrial conditions may be found in larger sales of cranes for foundries, machine shops and smelters made by Pawling & Harnischfeger, Milwaukee.

Work on the new foundry building of the Falk Company, adjoining its present works, will be begun shortly. Power is to be taken from the company's central plant and motors will be used on all tools not driven by compressed air.

The Interstate Light & Power Company, Madison, Wis., which recently closed important contracts in the zinc and lead district, has been formally incorporated by A. R. Case and others. It is understood that a chain of electric generating plants, partially utilizing water power, will be constructed.

The Vesper Steel & Malleable Casting Company, Vesper,

Wis., is completing a new foundry. Contracts for most of the equipment are understood to have been placed.

Interests identified to some extent with the Milwaukee Corrugating Company are said to contemplate the building of a rolling mill. Plans were prepared in detail about two years ago, but the industrial depression prevented their execution at that time.

The Menominee Gas Company, Menominee, Wis., has decided to install new machinery and build steel tanks to largely increase its present capacity.

The Bucyrus Company, South Milwaukee, Wis., has engaged to furnish another steam dredge for government service. It will be used on irrigation works in the State of Washington.

The Clintonville Advancement Association, Clintonville, Wis., is making an energetic campaign for the location of new industries in that city, including a modern machine shop and foundry.

J. F. M. Patitz and R. D. Tomlinson, engineers connected with the Allis-Chalmers Company, West Allis, Wis., have been granted patents on new types of surface and barometric steam condensers.

The Tri-State Light & Power Company has contracted for the erection of a 3500-kw. electric power plant at Galena, Wis. It is reported that the principal machinery will be furnished by the Northern Electric branch of the Fort Wayne Electric Works.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 4, 1909.

While the close of April was in no wise remarkable for machinery sales, and while the manufacturer had no evidence on his books of any special improvement in orders for immediate use, the opening of May brought with it a feeling that conditions have so improved with the rank and file of manufacturers generally that a buying movement is but a question of a few weeks or months at best. Among the tool lines that have shown in tone of correspondence and inquiries this optimistic sentiment, the manufacturers of milling machines, planers and shapers may be mentioned especially. An official of a large plant making a specialty of milling machines in discussing this point said:

"The conditions which produce a buying sentiment are so perceptibly improving that we are confident of an early return to normal demand in the tool trade. We are decidedly optimistic, not because of any existing increase in the volume of orders, but because of a continued improvement in those underlying conditions which betoken future business." A number of tool manufacturers continue to accredit the automobile industry with a large part of their semiprosperity and ability to have kept their plants going the past several months. Manufacturers of engine lathes have not as a rule done so well the last month as they did in March, while one or two establishments making a specialty of shapers had a better run of business in April than in the preceding month.

Under bids recently opened for tools and supplies at the United States Engineer's office, Cincinnati, lot 3, 14-in. engine lathe; 4, 16-in. crank shaper; 5, No. 3 grinding machine; 6, No. 2 hack saw, and 7, comb hand saw and power machine, were awarded the following bidders in order: Miller Supply Company, Huntington, W. Va.; Cincinnati Railway Supply Company, Cincinnati; W. T. Johnston Machinery Company, Cincinnati; Cincinnati Railway Supply Company, and Miller Supply Company.

The dealers in this market report fair to good business for April, with April a trifle behind March in volume of business.

In fitting up the plant of the Lexington (Ky.) Motor Car Company with some needed tools the W. T. Johnston Company and E. A. Kinsey Company, Cincinnati, secured $5000 worth of business in lathes, shapers, drill presses, &c. The first named also secured about $3000 worth of business from the Corry Castor Company, Corry, Pa., and has just sold to the McBee Bender Company, Athens, Ohio, a 16-in. back gear shaper.

Foundries have not made the expected gains for April; a few have increased their average of three, eight to ten ton heats per week to 10 and 12.

The Steptoe Shaper Company has finished a series of tests and has ready for shipment a 16-in. back gear shaper intended for the toolroom of the battleship Delaware, which is being inspected at the Newport News Navy Yard.

In car manufacturing lines there is reported a perceptible increase in inquiry with some substantial foreign purchases. The Ralston Steel Car Company, Columbus, is reported to have received an order for 50 of its 50-ton drop bottom steel cars from the Manchurian Railroad, and that this is but a forerunner of some additional orders from the same source. The Manchurian Railroad is said to have been in the market for some time for freight cars, having investigated carefully several types of American manufacture.

New England Machinery Market.

BOSTON, MASS., May 4, 1909.

May business is starting in a manner most hopeful for the machinery and supply trade. The first few days of the month have brought some very good orders, following a strong business which characterized the final days of April. As a whole, however, April was disappointing, most of the dealers finding its totals somewhat smaller than those of March, though one house reports the month as the best since 1907. Live inquiries are numerous, and some large concerns are making their appearance as important buyers for the first time in months. Without exception, so far as can be learned, all branches of the metal trades are finding a better condition as it affects their business, and believe that the outlook is most promising.

The railroads have not yet done any buying to speak of, but their own business is growing. The Boston & Albany is increasing its work at the West Springfield shops. The New York, New Haven & Hartford has made no official announcement of new repair shops for the western end of its system, nor have the Boston & Maine engineers come to a decision as to the details of the new repair shops to be started at Somerville, Mass., this season. The New England roads are parties to the general freight rate war, which should benefit shippers having business in the West, including, of course, the machinery trade.

The foundries report larger and more numerous orders, and a few of them are approaching normal production. The larger foundries have bought all the iron they will require for six months and more, having taken advantage of the low prices. Some smaller concerns are still holding off, so that at the present time buying is light in New England.

In the steel trade no marked change is apparent. Stocks have been replenished to some extent, the usual opinion being that prices are as low as they will be. The tool steel market reflects the almost universal optimistic sentiment of general business, and some slight improvement in orders is reported. The dealers in foreign steel are stocking up, partly in anticipation of improving business, and partly because the present indications are that the tariff will be increased on some lines.

An analysis of the condition of business among the machinery dealers, based upon figures, indicates that the first part of 1909 has not been so unprofitable, after all, especially when it is remembered that prices have been maintained. The volume of business has been about the same as during the same period of 1905, according to the books of a representative house, and it will be remembered that prices were lower four years ago. Taking these same figures, this house has this year done 71 per cent. of the business transacted during the very prosperous opening months of 1907. In 1908 only a little over 35 per cent. of 1907's total for the period was booked. This experience may not be equaled by some of the other dealers, but there is reason to suppose that it is close to the average. If such is the case, the probability of receding deliveries, following close upon the expected general revival of business, is strongly emphasized. It would take no very great increase in demand to bring the market to the level of two years ago at this time, which was well above the normal. The stocks of new machinery are by no means heavy. The dealers have fairly well filled storehouses and stores, and some of the manufacturers, notably of lathes and drills, have a good many tools on their hands. However, experience during similar periods has demonstrated that it takes but a short time in a rapidly increasing market to wipe out stocks, leaving the builders with only their producing capacity to meet the demand, and this will probably prove inadequate, as is usually the case. To be sure production will be greater than ever before, but the country's growth in manufacturing facilities no more than equals the natural increase in the market. Already quick deliveries are impossible in some lines, especially those which have the automobile trade as important customers. Manufacturers who have been regretting that they had tied up large capital in new buildings and equipment are now exceedingly glad that they have added to their producing capacity. Had they not built when business was good they would have waited until the depression was ended, and there would be delay probably extending well after the time when the need of the enlargement had begun to be felt.

The Atlas Machine Tool Company, Taunton, Mass., manufacturer of universal and plain grinding machines, has sold its business and equipment to the Modern Tool Company, Erie, Pa., and removal to that city has been completed. C. G. Trefethen, treasurer and general manager of the Taunton Company and designer of its machinery, has gone with the new owners, and will have charge of this department. The Atlas Machine Tool Company was established some five years ago. The sale and the dissolution of the corporation resulted from the necessity of settling the estates of the principle owners of the stock. The Modern Tool Company manufactures chucks, collets, self-centering dies and other precision tools.

The Boston Elevated Railway Company has not yet made

final plans for its new power plant, but announcement of location, horsepower to be developed and other details will be announced shortly.

A dispatch from Middletown, Conn., states that the Noiseless Typewriter Company, Buffalo, N. Y., with present offices at Hartford, Conn., has redeemed the bonds of the Eisenhuth Horseless Vehicle Company, Middletown, as a preliminary to acquiring possession of that company's plant, and will equip it immediately with machinery.

The Brass Products Company, Southington, Conn., has been incorporated with a capital stock of $50,000, to manufacture electrical fixtures. J. H. Pratt is the president; W. R. Miller, secretary and treasurer, and Joseph P. Gillette, New London, general manager and superintendent; these officers with John Hemingway and Edwin G. Lewis constituting the Board of Directors. All the officers are residents of Southington with the exception of Mr. Gillette. The company proposes to begin business in a small way, developing specialties which it is the intention to manufacture on a larger scale later.

The R. Wallace & Sons Mfg. Company, Wallingford, Conn., is to add a story to several buildings, which will give a considerable increase in manufacturing space.

Business at the works of the Fitchburg Machine Works, Fitchburg, Mass., builder of the Low-Swing lathe, has increased rapidly. The shops are running full and are taking on additional men, with the intention of still further increasing production. The automobile trade is the large customer.

Howard E. French, receiver of the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., has been authorized by the court to continue the business of the company, which has been manufacturing for some months under his management.

The new factory building of the Standard Metal Works Company, Thompsonville, Conn., already alluded to in this column, will be 80 x 120 ft., and will be used for the manufacture of bent pipes.

Among the projected enlargement of manufacturing plants in New England are the following: Pratt, Read & Co., Deep River, Conn., manufacturer of piano keys, factory 50 x 55 ft., two stories; John W. Green & Sons, Inc., Danbury, Conn., hats, three-story factory, 35 x 105 ft.; Haverhill Box Board Company, Haverhill, Mass., mill 100 x 230 ft., two stories; Waite Chair Company, Baldwinville, Mass., new factory, 50 x 106 ft., three stories; Rock Mfg. Company, Rockville, Conn., textiles, mill 50 x 180 ft.; Upson-Martin Carpet Company, Thompsonville, Conn., mill 50 x 150 ft., three stories; Perseverence Worsted Company, Woonsocket, R. I., textiles, addition 50 x 170 ft., two stories and basement; Weber Bros., North Adams, Mass., shoes, addition 50 x 90 ft., four stories.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 4, 1909.

The volume of sales made by local machinery houses in April shows little change as compared with March. A few report a slight improvement in sales, and others whose March business was helped by a few good sized orders state that there was a little falling off the past month. In one respect in particular the condition of the market shows no change, and that is the slowness in which prospective business is coming out. When there are inquiries for more than two or three machine tools buyers as a rule hold off for some time before placing the orders, and considerable business of this nature is now pending. The outlook has improved somewhat during the past week in that there are a few more scattering inquiries, but these are mostly for medium sized single tools. A large part of the business is coming from small shops that are adding a little to their equipment. This is between seasons in the automobile industry, and business from that source has fallen off, although some single tool orders are being received. The demand for second-hand tools is less active than it has been for several weeks.

With builders of some lines of machinery there is a gradual improvement in orders. The demand for cranes for shop purposes has picked up and local builders report that they have a good volume of orders on hand. Now that the season for outside work is at hand, there is some demand for locomotive cranes, but very few orders for cranes or other machinery are coming from the railroads. The demand for industrial cars shows little improvement and builders still complain that orders for equipment of this nature are still being taken at unsatisfactory prices.

In the foundry trade the demand for light gray castings is slowly improving, and a large share of the local light gray jobbing foundries are running at about 80 per cent. of their capacity.

The Adamson Machine Company, Akron, Ohio, has completed plans for the erection of a new plant, which will make its capacity three times as large as at present. The main building will be of brick and steel, 80 x 160 ft., and two stories high. This will be used for a machine shop and foundry. Adjoining this will be a blacksmith shop, 45 x 80 ft., and a power house. Three 20-ton electric cranes will be installed, contract for which has been given to the Cleveland Crane & Engineering Company, Wickliffe, Ohio. The company has also placed an order for a 100-hp. three-cylinder vertical Warren gas engine. It is expected that the company will be in the market a little later for a few machine tools. The new plant will be ready for operation about November 1. The company's principal products are molds and machinery used in the rubber making industry.

The Electric Mfg. Company, Cleveland, in which C. S. Britton and others are interested, has been incorporated with a capitalization of $25,000. The company expects to establish a small plant for the manufacture of electrical devices.

The Perry-Fay Company, Elyria, Ohio, maker of screw machine products, has commenced the erection of an addition that will practically double the capacity of its plant. Most of the new machinery equipment, which will consist largely of automatic machines, has already been contracted for.

The Cleveland Frog & Crossing Company will soon begin the erection of a loading shop about 150 x 200 ft. No machinery equipment will be required for the present.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 4, 1909.

An improvement is noted in the local machinery trade, not so much that a large increase has occurred in the volume of business, but rather in the general better feeling that prevails regarding the manner in which business has been placed and the outlook for the future. The past month's sales have in a number of instances showed a far better aggregate than any for a long time. In a few cases, notably with smaller establishments, conditions are more closely approaching the normal, but the larger plants while gaining slightly do not show any material betterment in production. While merchants have done a larger business, transactions have covered quite a variety of tools, and when these get distributed among the various makers the individual allotments are not very extensive. The railroads continue to buy sparingly, although it is to be noted that some of the various railroad repair shops in the East are gradually increasing working hours, and in a few cases the number of employees is larger. The larger iron and steel working plants and the industrial establishments gain but slowly, however, and have been but a small factor so far as the buying of new equipment is concerned. The automobile trade has been quite an active market recently, while quite a volume of business has developed from the industries outside of the general metal working field.

Sales of machinery and tools during the week have not been very heavy. There has been a fair amount of new business coming out, mostly small individually, although some moderately large propositions are in sight, and a number covering a few tools each are under consideration. Inquiries are a trifle better on the whole and are inclined to lead up to business more rapidly than heretofore, and, while still confined largely to single tool propositions, there is a fair sprinkling of those of a more extensive character.

Little of interest has developed in the export trade, particularly in the general line of machine tools. In equipment of a special nature, power transmission machinery, &c., a slight improvement is to be noted. Manufacturers transacting an established business abroad report conditions a shade better, although orders are still comparatively small.

The second-hand machinery trade has been moderately active. Purchases have been principally in single tools of various characters, mostly in the smaller and medium sizes. The demand for engines and boilers is somewhat better. The increase in the erection of manufacturing buildings of a general character has brought out considerable inquiry for power equipment, and several good sized installations are being figured on.

Jobbing foundries report a better run of orders. Those engaged on work for textile manufacturing equipment are comparatively active, but there has been but little betterment in the demand for machinery castings. The larger steel casting plants are still more or less inactive, although the crucible steel casting plants are, as a rule, busy.

The People's Ice & Cold Storage Company, West Chester, Pa., a recently organized company, has been granted a charter. The company has a capital of $50,000 and will construct and operate an ice manufacturing plant.

The Pennsylvania Railroad has filed plans in Baltimore, Md., for its proposed new Union Station in that city. Among other things, they provide for a 50-ft. extension to the present building, alteration of bridges, installation of passenger elevators and other improvements of an extensive nature.

The City Council of Camden, N. J., is seriously con-

sidering the erection and operation of a municipal ice manufacturing plant. At a recent meeting a resolution was adopted, instructing the chief engineer of the water department to secure data as to the cost of erection and maintenance of such a plant.

Henry Disston & Sons, Inc., have let contracts for the erection of a new machine shop, 60 x 100 ft.; blacksmith shop, 60 x 80 ft.; pattern storage building and a general warehouse, 60 x 100 ft., the last being two stories. With the exception of the pattern storage building, which is to be of reinforced concrete, the new buildings will be of brick and steel construction. About $5000 will be spent for the equipment of the machine shop, which will have an overhead electric crane and a general line of machine tools. Bids have already been received for the necessary equipment, and purchases practically decided upon, although the formal orders have not yet been placed.

The Hess Machine Works notes an improvement in the domestic demand for file making machinery, although that from abroad, which is usually pretty fair at this season, still drags. There has been a moderate amount of special work offered, enabling the plant to be operated at about 50 per cent. of its capacity. Two sets of file making machinery have been recently shipped to England, while six sets have been furnished to domestic customers.

The Philadelphia & Reading Railroad Company will receive bids until May 26 for construction work appurtenant to the abolishment of grade crossings on the Philadelphia, Germantown & Norristown Branch along Ninth street in this city. Under contract No. 19 bids will be received for permanent signals, Green to Broad street; contract No. 33 covers signal bridges, Norris to Broad street, and contract No. 34 covers the erection of two signal towers. Plans and specifications may be obtained from W. Hunter, chief engineer, Room 520, Reading Terminal.

The Link-Belt Company notes some betterment in the demand for its various classes of transmission equipment, both from foreign and domestic sources. It has recently taken orders for coal and ashes handling machinery, bituminous coal handling machinery, gravity discharge elevators and miscellaneous elevating and conveying machinery for sugar handling, for delivery in Cuba, while orders for screening apparatus and ashes handling machinery have been received from Nova Scotia. There has also been a fair run of domestic orders, covering elevators, conveyors and miscellaneous machinery for handling phosphate rock in Florida, while customers in Pennsylvania, New Jersey and New York have contributed orders for retail coal pockets, a locomotive coaling station, coal and ashes handling equipment, as well as elevating and conveying machinery for a variety of purposes.

Government Purchases.

WASHINGTON, D. C., May 4, 1909.

The Isthmian Canal Commission will receive bids until May 24, Circular No. 508, for locomotive cranes, pneumatic hoists, duplex pumps, pipe threading machine, wood working machines and other supplies.

Bids will be received until May 17 at the office of the United States Marine Corps, Washington, D. C., for an electric elevator to be installed at the Depot of Supplies in Philadelphia, Pa.

The following bids were opened April 27 for machinery for the navy yards:

Class 61.—One new model engine lathe—Bidder 58, Fairbanks Company, New York, $1052; 83, Hendey Machine Company, Torrington, Conn., $1158; 151, Pratt & Whitney Company, Hartford, Conn., $1450.

Class 62.—One crank shaper—Bidder 57, Frevert Machinery Company, New York, $593; 58, Fairbanks Company, New York, $545; 65, Garvin Machine Company, New York, $625; 69, Gould & Eberhardt, Newark, N. J., $695; 126, Manning, Maxwell & Moore, New York, $575; 136, Niles-Bement-Pond Company, New York, $566; 153, Queen City Machine Tool Company, Cincinnati, Ohio, $630 and $600.

Class 71.—One universal grinding machine—Bidder 28, Brown & Sharpe Mfg. Company, Providence, R. I., $925.30 and $923.10; 136, Niles-Bement-Pond Company, New York, $848; 145, Prentiss Tool & Supply Company, New York, $894.

Class 72.—One universal grinding machine—Bidder 28, Brown & Sharpe Mfg. Company, Providence, R. I., $660; 57, Frevert Machinery Company, New York, $62, $67 and $91; 189, William Sellers & Co., Philadelphia, Pa., $210 and $160.

Class 81.—One steam driven air compressor outfit—Bidder 4, American Compressor & Pump Company, New York, $735; 79, Hall Steam Pump Company, Pittsburgh, Pa., $630; 91, Ingersoll-Rand Company, New York, $1035; 213, Westinghouse Air Brake Company, Pittsburgh, Pa., $478.

Class 82.—One upright drilling machine—Bidder 57, Frevert Machinery Company, New York, $168; 59, Fairbanks Company, New York, $205 and $165; 65, Garvin Machine Company, New York, $235; 126, Manning, Maxwell & Moore, New York, $145; 136, Niles-Bement-Pond Company, New York, $168; 145, Prentiss Tool & Supply Company, New York, $157; 199, Tucker Tool & Machine Company, New York, $159.

Class 83.—One lathe—Bidder 57, Frevert Machinery Company, New York, $419; 59, Fairbanks Company, New York, $495; 83, Hendey Machine Company, Torrington, Conn., $499; 115, J. B. Morris Foundry Company, Cincinnati, Ohio, $392; 126, Manning, Maxwell & Moore, New York, $495; 136, Niles-Bement-Pond Company, New York, $446; 145, Prentiss Tool & Supply Company, New York, $459; 151, Pratt & Whitney Company, Hartford, Conn., $552; 173, Springfield Machine Tool Company, Springfield, Ohio, $433.50; 199, Tucker Tool & Machine Company, New York, $446.

Class 84.—One horizontal boring machine—Bidder 59, Fairbanks Company, New York, $1125; 108, Lucas Machine Tool Company, Cleveland, Ohio, $1450; 136, Niles-Bement-Pond Company, New York, $1157 and $937; 145, Prentiss Tool & Supply Company, New York, $1150.

Class 151.—One motor driven plate bending roll—Bidder 17, Bethlehem Steel Company, South Bethlehem, Pa., $14,260 and $16,184; 126, Manning, Maxwell & Moore, New York, $10,975; 136, Niles-Bement-Pond Company, New York, $19,685; 218, Wickes Brothers, Saginaw, Mich., $15,665.

Class 220.—Four vertical simplex feed pumps—Bidder 22, Blake & Knowles Steam Pump Works, New York, $113.50; 46, M. T. Davidson Company, Brooklyn, N. Y., $82.50; 201, Union Steam Pump Company, Battle Creek, Mich., $104.50; 208, Vermilye & Power, New York, $382.50.

The following bids were opened April 21, Circular No. 500, for machinery for the Isthmian Canal Commission:

Class 1.—Six horizontal centrifugal pumps—Bidder 2, Alberger Pump Company, New York, $7632; 39, Buffalo Steam Pump Company, Buffalo, N. Y., $6747 and $8027; 41, Camden Iron Works, Camden, N. J., $9765; 47, Central Metal & Supply Company, Baltimore, Md., $12,600; 72, De Laval Steam Pump Company, Trenton, N. J., $7500; 81, D'Olier Engineering Company, Philadelphia, Pa., $7116; 96, Fore River Shipbuilding Company, Quincy, Mass., $9498; 124, Jeanesville Iron Works, Hazelton, Pa., $7100; 146, Manning, Maxwell & Moore, New York, $8700; 236, Union Iron Works, San Francisco, Cal., $9555; 245, Vermilye & Power, New York, $7983; 258, Henry R. Worthington, New York, $9164, $7796 and $7474; 261, Allis-Chalmers Company, Milwaukee, Wis., $10,425; 274, A. Lloyd, Erie, Pa., $7034; 282, Watson-Stillman Company, New York, $8400.

Class 69.—Two rail benders—Bidder 21, Berry & Aiken, Philadelphia, Pa., $68; 163, Motley-Green & Co., New York, $244; 245, Vermilye & Power, New York, $237; 267, Excelsior Equipment Company, Pittsburgh, Pa., $189, $170, $100 and $80; 270, Fox Brothers & Co., New York, $190.

Class 61.—One hydraulic punch, has been awarded to Manning, Maxwell & Moore, New York, at $36.

Under bids opened March 9 for machinery for the navy yards, the Pratt & Whitney Company, Hartford, Conn., has been awarded class 81, four engine lathes, $1550.

Under bids opened April 20 for machinery for the navy yards, Harron, Ricard & McCone, San Francisco, Cal., have been awarded class 1, two screw cutting extension gap lathes, $831.

Trade Publications.

Gears.—Philadelphia Gear Works, 1120-1122 Vine street, Philadelphia, Pa. Folder. Calls attention to the company's general line of gears and mentions its new 1909-1910 catalogue.

Small Internal Grinder.—Waltham Machine Works, Waltham, Mass. Folder. Contains a photograph of an automatic inside grinding machine intended for grinding holes of small sizes and up to 1 in. or more in diameter. It is an automatic machine and two or more can be cared for by one operator.

Milling Cutters.—National Tool Company, Cleveland, Ohio. Booklet. Lists the company's line of high-speed steel and carbon steel milling cutters of all kinds, with prices, and offers suggestions for the care and use of cutters.

Presses, Dies, Tools and Special Machinery.—Adriance Machine Works, 254 Van Brunt street, Brooklyn, N. Y. Catalogue, 5¼ x 7¾ in., 62 pages, cloth binding. Shows the company's line of special equipment for working sheet metal, wire and paper. Included are inclinable open back power presses, power punching presses, wiring presses, combined horning and wiring presses, arch power presses, embossing presses, reducing presses, an inverted blanking press particularly adapted for blanking thin metal, such as ordinary gauges of thin plate sheet brass, &c., double-crank presses, double seaming machines, automatic screw rolling machines, squaring shears, gang slitting machines, foot presses, &c.

Conveying, Transmission and Screening Machinery.—Stephens-Adamson Mfg. Company, Aurora, Ill. Catalogue, 6¼ x 9¼ in., 672 pages, bound in cloth. Belt conveyors of numerous designs and belt conveyor fittings are illustrated, together with views of important installations for conveying material of various kinds. Chain elevators are shown in numerous types, and chain conveyors, pan conveyors, especially adaptable for handling crushed stone, together with some special ash handling and coal handling equipment. Numerous types of ore bin hoppers and gates, elevators, buckets and fittings, screens for mining purposes, separators, mining hoists, mining cars, transmission rope, &c., are shown, together with a full line of gears and general repair fittings. Useful tables are included.

Feed Water Regulators.—The S-C Regulator Company, Fostoria, Ohio. Booklet. Describes the S-C water level regulator and explains its operation. An installation in the power plant of the Continental Sugar Company at Fremont, Ohio, is illustrated, and an inserted data sheet compares the readings on a water column of a boiler with and without the regulator.

Recording Pressure and Vacuum Gauges.—The Bristol Company, Waterbury, Conn. Bulletin No. 102 and folder. The bulletin shows specimen sections of the charts made for use on recording pressure vacuum gauges, and the folder shows a combination indicating and recording unit of the Wm. H. Bristol electric pyrometers.

Grinders.—Robinson Tool Works, Waterbury, Conn. Shows a grinder which is equally adaptable for surface grinding, milling machine cutter grinding, twist tool grinding and general tool grinding.

HARDWARE

ONE of the constant problems before every merchant is to make sure that he is filling his place in the commercial field and supplying with proper enterprise the goods in his branch of trade which are called for or should be called for by the community. To do this completely and successfully requires not a little care and thought and a well balanced management of the business. Nor is this accomplished as frequently as might seem on first flush to be the case. There are comparatively few stores whose business is symmetrically developed. Stores are usually strong in one or more classes of trade and notably weak in other directions. There may, for example, be a large and profitable business in Heavy Hardware or Factory Supplies, with only a limited trade in the finer Hardware and House Furnishing Products. The Tool trade may be well developed and the establishment be the resort of mechanics who are attracted by the assortment of goods, new and old, which are offered for their inspection, and the intelligence with which they are selected and displayed. Or it may be that the store in a quiet and almost negative way simply contains the ordinary supply of regular Hardware goods without emphasizing any branch—perhaps because there is no great effort made to push any department of the business—with the result that the store enjoys a trade which is only a fraction of what it might be with more energetic effort. Even in such cases it is probable there is uneven development and that one or more branches of trade are much better represented than others and are cultivated with more success. It is well worth the merchant's while to look at his own establishment in the light of this principle and discover where he is strong and where he is weak.

Among the departments of business to which merchants who are within reach of an agricultural community should give most careful attention is the farmers' trade. One of the questions brought up in connection with THE IRON AGE QUESTION BOX is how to cultivate trade relations with the agricultural classes. The correspondent who asks the question is a notably successful merchant whose patrons are chiefly residents of the city in which his business is carried on. His case is an illustration of the tendency referred to in the last paragraph. He enjoys a large and profitable trade with the townsfolk, but has not succeeded in doing much with the farmers. The country is full of similar instances. The farmers' trade is, however, peculiarly desirable, and those who have not secured a good share of it should endeavor to find out the reason, and remedy the trouble, whether it lies in their inadequate stocks or is chargeable to defective business organization and methods.

Condition of Trade.

The great event this week is the announcement of a revised schedule of prices on Wire Nails and Wire. As narrated in detail in the following columns a substantial reduction in the regular schedule has been made, ranging from $7 a ton on Wire Nails to $10 a ton on Barbed Wire. These important products are thus brought into harmony with the lower prices which have been developed in the iron market, and a line which has been under suspicion for some time has been conformed to the present order of things. The immediate result is the placing of many orders, as the trade are disposed to regard the reduction as a reasonable one which puts Wire Nails and Wire on a stable basis and permits them to be dealt in without the apprehension of a radical decline, which has kept back business in this line for the past few months. The effect on the market at large will undoubtedly be good. An important step has been taken toward putting the market as a whole on a safe level and thus justifying the enterprising and earnest prosecution of business without fear of serious shrinkage in the value of stocks on hand. The action taken will thus contribute to the development of the more confident spirit to which we referred in our last issue, and which continues to characterize the trade, notwithstanding the adverse influence of cold and stormy weather, with some injury to crops and interference with regular agricultural operations. Other indications of various kinds point toward a better condition of things throughout the country and the gradual development of a larger volume of business.

Chicago.

Storms of wide extent and great severity, accompanied in some portions of the country by deep snows and in others by cold, chilling rains, have been distinctly unfavorable to the free development of trade during the past week or 10 days. The retarding effects have been directly felt in some lines, notably Wire Cloth, Wire Netting and other goods of like seasonable character. The second orders, which, under the stimulus of earlier favorable weather, began to come in at a good rate and on account of the conservative amount of early buying were expected to be rather more liberal than is normally the case, have dropped off considerably in the past week. Some of the business thus developed will, of course, be only temporarily withheld, but there is always a portion of it that, passing the critical moment, is indefinitely postponed. Notwithstanding the drawbacks thus encountered, there is on the whole a fair demand, which continues to increase slowly, but surely, in a manner that augurs well for permanency. While the sales totals for the month are at this writing not fully cast up, it is generally estimated they will show a distinct margin of gain over those of March. Of importance as indicating a halt in the downward trend of prices in the heavier lines of Iron and Steel is the determined stand taken by leading producers against any further concessions. This should in time be reflected in a firmer feeling in many articles of Hardware, whose values are based upon steel prices. That a fair volume of business in Wire and Wire Nails is moving is due solely to the consumptive demand, since distributers, both wholesale and retail, have been buying as little as possible on account of the im-

pending drop in prices. Continued expansion of building operations is reflected in a more active demand for Builders' Hardware, and while the prices ruling are not especially attractive, the fuller engagement of plant capacities is proving a strong factor in more economical production. All things considered, the situation as respects the Hardware trade is by no means lacking in features of encouragement.

Cleveland.

W. BINGHAM COMPANY.—The movement of certain kinds of goods in the Hardware line is many times a barometer of what the trade is and what it is probably going to be in the near future. From the number of dozen Shovels sold out of this market the first quarter of this year, January to April 1, as against the same quarter of last year, it would indicate that dirt is going to fly, for our records show that we have sold and shipped hundreds of dozens more Shovels this year than last year.

Trade in the general line is very fair and spring goods are going forward in good volume. Our sales for the month of March this year are far in excess of any March in the last six years, indicating that jobbers who have carried stocks and given good service are being favored with a large trade from the farming or agricultural district.

Trade in mining, milling and manufacturers', also railroad, supplies is not up to the standard yet. All business men have been under a severe strain in the last year, but we think the corner is being turned and the tide is now tending toward prosperity. This optimism is based upon the reports that we receive of conditions from all sections of the country. The country is bound to go ahead; it cannot stand still, and propulsion is coming.

It is unfortunate when the country is on the upward grade of prosperity that a damper should be put on by the tariff talk. We all hope that soon it will be a thing of the past and all can settle down to business at the same old stand with a larger volume than ever. We trust and believe that our national legislature will round up a safe and sane bill that will protect us against articles made in Germany, England and France and other countries. It is wholly to our interest to have American goods well protected and American labor well employed and well paid, and hope that conservative ideas and talk will prevail, so that we can get back to our former idea as soon as possible, namely, "Let well enough alone."

When we stop and think of territory that Uncle Sam has purchased and what he has made of it our thoughts go to Alaska. When William H. Seward, in behalf of the United States, negotiated for the purchase of Alaska from Russia for $7,200,000, many thought it was one way of showing friendliness to the Russian Government, but statistics show that the total gold receipts at Seattle from Alaska for the calendar year 1908 amounted to over $15,000,000, or more than double the amount paid for the entire territory. In the last 10 years over $76,000,000 of gold from Alaska has been assayed at Seattle. Right smart purchase, we think.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—General business continues to improve, less rapidly, it must be confessed, than the most sanguine expectations earlier in the year, but the gain is substantial enough to indicate that things are on the up grade again despite the unseasonable weather and the continued uncertainty at Washington over tariff matters.

The disposition to close large contracts for structural steel in this city and elsewhere is a clear indication that large buyers have decided that the chance to purchase at lower rates has passed, and this will encourage the rank and file, who have been waiting to see what the big fellows were going to do before they gave orders for their requirements.

There has been a decided boom in the building of residences, both in the city proper and in the surrounding suburbs. Several large building operations calling for heavy tonnage and structural steel are just about starting or well under way. The last section of the new Wanamaker store (which, by the way, will contain 10 acres more floor space than any other department store in the world) is up to the sixth floor, and justifies the prediction that the lower floors will be ready for the holiday trade this year. The Curtis Publishing Company has let the contract for its new building, which will be the largest and finest publishing house in the world. The Bellevue-Stratford Hotel is increasing its accommodation by more than 350 rooms, and work on this addition has just about begun.

Baltimore.

CARLIN & FULTON.—From general reports trade is spasmodic, one day being stimulated by good weather and the suggestions of the approach of the good old summer time, while the next day it drags when a frost seems imminent, and also on account, it is claimed, of the uncertainties of the tariff, and what might be the future of the market.

The new prices just announced by what is termed the leading interest in the Wire market will clear away any uncertainty as to the Wire Nail situation, and we think the trade now can look forward only to advances after the radical reduction just made.

In regard to the tariff there are predictions made that as soon as a bill of some kind is passed trade will at once revive, but possibly that is putting too heavy a responsibility upon such legislation. From a study of the proposed changes the effect upon the Hardware market will be very trifling, as far as new prices are concerned, but to anticipate a boom to follow the passage of a bill is hardly wise. The improvement in trade is going to be gradual and cannot be forced.

Railroad earnings and bank clearings have both increased, and are indicative of greater business activity, but at the same time net earnings can be the result of economies in maintenance, and bank clearings may be the result of an active speculation in stocks. Until after July 1 we look for a good healthy business based upon legitimate demand and supply and devoid of speculation.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—The Government must have revenue. The manufacturing of this country must be developed. High priced labor in this country must be protected from low priced labor abroad. All these things are agreed upon. The whole point is not to allow the pendulum to swing too far one way or the other. There are other interests in this country to consider besides those of the manufacturers.

On many goods, especially in the Hardware line, the tariff was placed so high it meant absolute prohibition. The goods stopped coming from Europe. As there were no importations naturally it followed there was no revenue. So the Government lost out. The entire trade of the country on these lines was turned over to the American manufacturers. Many of these manufacturers formed trusts and selling combinations to protect themselves from each other. Therefore, there has been no foreign competition and there has been no domestic competition. The jobber, the retailer and the consumer have been at the mercy of the manufacturer.

So we have had the spectacle of a number of manufacturers protected by the tariff, protected by patents on goods and machinery, protected by the copyright laws, and then still further protected by selling agreements. The result has been just what might be expected under such conditions.

Then a number of these manufacturers, having their own nests so nicely feathered, have absolutely forgotten that the jobber should have a percentage of profit on their goods that slightly more than covered the cost of distributing them. In almost every case where manufacturers have been able to bring about this condition they have cut down the profits of jobbers on their goods. This is not only true of Hardware, but of other lines.

These same manufacturers have then sold their goods to catalogue houses and permitted them to demoralize the retail profit, so the retailers by reason of this competition were cut out of their profits.

Therefore, we find by this condition that the Government loses revenue, the jobber is compelled to sell the goods at about the cost of distribution, the retail merchant is cut out of his profits by the competition of catalogue houses, while the manufacturers have derived enormous profits.

We believe in protecting our manufacturers; we believe, of course, the Government must have revenue, but we believe the pendulum has swung entirely too far on the side of many of our great manufacturers. Take, for instance, a specific case:

There has been a tariff of about 55 per cent. on Razors. It is now proposed to advance this tariff to 100 per cent. Razor manufacturing in this country is a very small industry. Razors are made by skilled mechanics. These skilled mechanics in Europe receive good wages. Living in Europe is cheap. We are informed it is impossible to persuade these European Razor grinders to come over to this country. Now it is proposed to turn the enormous Razor business of this country over to a few American manufacturers. It would be impossible for them to handle the business. The price of Razors is already high enough, but this change would mean the price would be doubled to consumers.

Not satisfied with this the Cutlery manufacturers of this country are trying to have a law passed that all Cutlery manufactured in a foreign country should not only bear the name of that country, but the name of the manufacturer should also be stamped on the goods. This means the source of supply of every dealer in Cutlery in this country would be exposed. This requirement is not made of American manufacturers. Why should it be made of foreign manufacturers, or on any other class of foreign importation?

All importers in this country are well aware of the troubles they have had to suffer at the hands of the customs officials in certain Eastern ports. Even in those cases where the tariff allowed goods to be imported American jobbers have been put to so much trouble by the customs officials that they have almost given up in despair.

It may not be generally known that the tariff is not assessed on the invoice price you pay for goods in Europe. The law is that it is the "market" price. Therefore, if you make a very desirable purchase in Europe—lower than the market—the customs officials decide what the market price is and you are compelled to pay duty, not on the price you paid, but on the price that the customs officials decide is the market abroad. For instance, if you should buy Lead Pencils at a very low price abroad the customs officials would decide you had bought them too cheap—the price should be higher—and, therefore, they assess the duty on the higher price.

We understand the Senate committee in deciding these perplexing questions is taking into consideration whether the American manufacturers interested have made combinations and selling agreements to "hold up" the trade in this country. We understand there have been some interesting developments along this line.

We sincerely trust that no such advance in the tariff will be made, and that no such burden as the ridiculous and irritating ruling in regard to stamping the name of the foreign manufacturer on all Cutlery will be imposed upon the distributing interests of this country.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The weather this spring is very nearly normal in temperature and rainfall. This is eminently satisfactory in that it has held back the fruit and early garden vegetation, while the ample precipitation is filling springs and cisterns against possible summer drouth.

At last the business people seem to be somewhat worried over the tariff. It looked a little while ago as though they simply declined to be stirred up out of indifference, but when we see long speeches day by day made apparently on unimportant points, it reminds us that people not only have Axes to grind, but that they are making a great many revolutions of the wheel to the minute, and that they are buying neither Axes or Grindstones from the Hardware trade.

Banks claim to have fair use for their funds and are doing well with average business requirements. Never before did planting go forward with more assurance. There is a large acreage of cotton, tobacco, corn, wheat and oats, while inducements to make hens lay more eggs and cows give more milk are the most diligently read advertisements in the rural journals. The population seems to have outgrown agricultural development.

Such high prices still prevail that the poor man wonders where he comes in. Seven dollar flour is a tough proposition, whether made up by the young bride or the well seasoned housekeeper. Town life has been made too attractive, with its nickelodeons and moving picture shows. We shall have to contrive some way to make the town duller or we shall have all the people off the farms.

Boston.

BIGELOW & DOWSE COMPANY.—Throughout New England there is more animation in general business than at any time since the coming of the new year. Until March trade was erratic, short seasons of depression following a very satisfactory business. In March the improvement was continuous through the month and the volume of sales will compare favorably with any month in the past three years.

A slight decline in some staple lines has increased the orders. Some of the trade were holding back, but now seem satisfied to buy.

Cold and unsettled weather held trade back, but the warm days started every one with a rush. Tariff talk has ceased to stop buying, for the season is so far advanced that the merchants must have goods to supply the demand.

The cotton industry is prospering and new mills are now building in New England that are to cost $20,000,000. Large interests are placing orders far in advance in the belief that the present is an opportune time to buy.

The outlook is encouraging and brighter than it has been for many a day. Stocks in the hands of the merchants and manufacturers are light. A sudden buying movement will create a shortage in many lines. To-day all the mills are flooded with orders for Wire Fencing, making it difficult to secure prompt shipment.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—There is nothing specially new to report in regard to trade conditions in the Missouri Valley and adjacent territory. Business continues in remarkably good shape, in spite of the very rough, cold and unseasonable weather which has prevailed for the past two months. To-day the thermometer registers several degrees below the freezing mark, accompanied by a cold, blustering wind from the Arctic regions. This is merely a sample of what it has been for several months and consequently the growth of everything is very much retarded. The change to spring conditions will come soon and suddenly and the general transformation will be equally surprising. The volume of business will also receive a generous impulse by the advent of balmy spring climatic conditions.

The prospects for next season's crops will be the main topic of interest affecting this section. It is too early yet to form any opinions on this important subject, but up to date no complaints are heard from the rural districts.

We are pleased to note a decided improvement in the activity of business in the iron regions of Ohio and Pennsylvania, which has been delayed longer than was anticipated. We believe that with tariff legislation settled general business will show vastly increased improvement. The West is all right, and always has been for that matter, and we are doing all we can to bring the East up to the same level.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—May day is here, but the weather conditions do not correspond with the cal-

endar. April was not a month of unusual storms, nor, on the other hand, were there many days that were warm and springlike. In southern Minnesota and Wisconsin and northern Iowa there was too much moisture for the farmers to do their seeding, while in northern Minnesota and North Dakota the weather was too cold, as well as moist, for much seeding to be done.

In the last few days there has been a fall of rain and snow over the country generally and seeding is stopped for the time. Probably about 25 per cent. of the seeding in northern Minnesota and North Dakota has been done, with a still larger share in central Minnesota and the southern part of North Dakota. In southern Minnesota and northern Iowa seeding is very backward, but with favorable weather it can soon be put into good shape. Seeding will probably soon be resumed and it may be pushed along rapidly. It is a standing maxim among our farmers that small grain must be in the ground by not later than May 20, so there are now only about three weeks left for it. It is probable that the work will be well along by that date.

This year it has been hoped the crops might go in under favorable conditions. Fall plowing was done to a larger extent than usual, giving a better seed bed for the grain and also the advantage of earlier seeding. The assurance of good prices for the next crop has also led farmers to prepare for a larger acreage. Altogether it has been hoped the Northwest would start out with fine prospects for the 1909 crop. There is still time for this, but there is not much time to lose.

All eyes are now turned toward Washington and the doings of Congress on the tariff. The discussion has now reached the acute stage in the Senate and this condition will doubtless continue till the end is reached. The people have relied on the assurance before the Presidential election that the tariff would really be revised downward, and if this is not done there will be a day of reckoning ahead. There must be a substantial reduction along the line or there will be disappointment now for the people and for the politicians later.

In the future also, there must be a reduction of the expenditures of the Government. It is now spending a great deal too much. It not only generally pays too much for what it gets, but it gets too much. It is high time to call a halt and go slower. The public expenditures are enormous and the high tariff rates have helped largely toward these extravagant outlays. The popular demand is coming to be for less extravagance in outlay and lighter burdens in the tariff. The wise politician has his ear at the ground in these days, and we believe the foregoing is what he is hearing.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The heavy spring business in Hardware is now behind us. The volume of business has not been quite up to our expectation. Spring trade was better than it was in 1908, and another encouraging feature is the fact that April compares more favorably with 1908 than any other month. There seems to be in the last two weeks a feeling of more confidence, and we think the reported improvement in the Steel market at Pittsburgh will strengthen this confidence in the future, and we now expect a steady improvement, although, of course, we do not look for a heavy trade during the summer months, as this would be unusual.

The wheat crop in this section is in a most excellent condition. The hay crop promises well. A very important crop with Tennessee farmers is the berry and early vegetable crop. While they are not early this season they are looking well and the favorable season will soon be coming on the market. The farmers of the South are making herculean efforts to produce a good crop in 1909, and when the season has sufficiently advanced to issue a good crop we confidently believe that there will be a very decided improvement in business. Collections are about as usual at this season of the year.

Portland, Oregon.

FAILING-MCCALMAN COMPANY.—General conditions in the Pacific Northwest continue to be excellent, with an improving outlook for the future. Reports from all over the Northwest lead us to believe that crops will be more than excellent this year, with the prospect that our great staples will command a high price.

New settlers are coming into this territory in even greater numbers than they have before, and we believe that as a result of the Alaska-Yukon-Pacific Exposition at Seattle there will be even a greater inflow later in the year than at present. These settlers are almost universally people who have made money in their old homes, but wish to come out here where they can not only make money but enjoy the wonderful climate of the Pacific Coast. As our settlers are of this class, it would seem to promise a great increase in business in the future in all lines.

Another factor in trade conditions which promises well for the immediate future is the increased activity in railroad building, especially in the State of Oregon. Two large projects are actually in the course of construction in the immediate neighborhood of Portland, not to speak of improvements and extensions that are being made by all lines in this vicinity.

In the neighborhood of Seattle and Tacoma the wonderful activity in railroad building which has existed for the past year will continue undiminished for the remainder of the present year.

Taking it all together, we can say that business is good to-day and promises to be better to-morrow.

NOTES ON PRICES.

Wire Nails.—The uncertain and unsatisfactory condition of things in the Wire and Wire Nail market has been terminated by decisive action on the part of the American Steel & Wire Company. The gradual sliding down of prices, which has characterized the market for the past few weeks, reflected a condition which the leading interest, as well as other manufacturers and the trade at large, regarded unfavorably. It contrasted unpleasantly with the comparative uniformity in prices which has for some time prevailed and caused the transaction of business by both manufacturers and merchants to be attended with a good deal of uncertainty and annoyance. It has been recognized since the break in steel prices that a readjustment of Wire prices was inevitable, and that lower quotations would develop in the regular course of trade, or by formal announcement. It was, however, deemed advisable to defer the reduction until the spring trade was practically over, as this would enable merchants to dispose of a great part of stocks on hand, and at the same time yield to the manufacturers a better margin of profit on current business. The increasing irregularities of the market, especially during the past two or three weeks, and the prospect that this downward tendency would be continued have brought about an open reduction, and the announcement of a new schedule of prices for Wire Nails, Plain Wire, Barbed Wire and Fence Staples. These new prices represent a reduction of $7 a ton on Wire Nails, $8 a ton on Plain Wire and $10 a ton on Barb Wire from the former schedule of prices, which had, however, become only nominal, as concessions of about $2 a ton were frequently made. It will thus be seen that radical action has been taken, putting the price on a basis beyond which the manufacturers expect that it will not settle, and from which it is hoped that advances may take place when the condition of the market and the character of the demand justify a moderate upward movement. The leading interest is refusing to accept contracts for future delivery, and all orders are taken subject to shipment at its convenience. The former differentials between the jobbers and retailers and between carload and less than carload lots are continued. There is little doubt that merchants who have been holding aloof from the market and trying to work their stocks down to the lowest possible point will feel justified in buying in quantities to cover their requirements. It is anticipated that the other manufacturers of Wire Nails and Wire will adopt the prices thus announced. The new schedule of prices is as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days, but are sometimes shaded as stated above:

Carloads, to jobbers	$1.60
Carload lots to retail merchants	1.65
Less than carloads to jobbers	1.65
Less than carloads to retail merchants	1.75

New York.—The market has not had time to settle and on such necessary business as has been done this week the buyers of small lots have doubtless relied upon the protection of those from whom they purchase. Some efforts have already been made in this city to place open contracts, but without success. The indications are, however, that a buying movement of some proportions will immediately ensue. A quotation of $1.90 to $1.95 per keg may be mentioned as representing the store price in a general way.

Chicago.—The expected revision of prices has been realized by the official announcement made by the leading makers of a cut of 35 cents per keg, effective May 1, reducing the price from a basis of $1.95 to $1.60 per keg, Pittsburgh. The unsettled condition of the market, which of late has been characterized by extreme irregularity, made it certain that such action was impending, but the extent of the decline is rather greater than was generally looked for. It was evidently the purpose of manufacturers to go to the bottom at one stroke rather than to prolong the period of uncertainty by hesitating downward steps. Timed at a moment when the general sentiment is seemingly veering from a downward to an upward course, the fixing of prices at the low level named is expected to have a pronounced effect in stimulating trade. Even under the adverse conditions heretofore existing, the amount of business coming to the mills has been of considerable volume, and if this is largely augmented by the low prices now offered, it will not take long to bring mill operations up to full capacity. We quote revised prices as follows: $1.78, Chicago, in car lots to jobbers, and $1.83 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Effective May 1, the American Steel and Wire Company and the Pittsburgh Steel Company, the two leading makers of Wire Nails, announced a reduction in prices of Wire Nails to $1.60, base, f.o.b. Pittsburgh. This is a reduction of 35c. a keg from the official price of $1.95, which has not been held for several months past, Nails having sold at low as $1.85, and in a few cases at $1.80 per keg, a short time before the official reduction was made. This action on the part of the Wire Nail makers has been anticipated by the trade for some time, and would probably have been made long ago but for the desire of the mills to allow any stocks held by jobbers to be reduced as much as possible before the reduction. We are advised that no contracts for extended delivery will be accepted at the new price, but that specifications must accompany each order for early shipment. This is taken to indicate that the mills do not expect the low price of $1.60 on Wire Nails to be in effect a great while, and therefore do not desire to have long time contracts on their books when an advance is found possible. It is stated that since the reduction was made, orders for early shipments have been received by the mills quite freely, and the present movemnt in Wire Nails from mills to jobbers and consumers is heavy. We quote Wire Nails at $1.60 in carloads and larger lots, f.o.b. Pittsburgh.

Cut Nails.—The Cut Nail market has been virtually stagnant this week, developments in Wire Nails commanding all the attention of the trade. While it cannot be foretold what the effect on Cut Nail prices will be, it is generally argued that there is not room for such a reduction as has occurred in Wire. Indeed, many declare that Cut Nails are not likely to be obtainable much below the figures at which they have recently been selling. At the present writing there has been no formal change in quotations and the trade is awaiting developments.

New York.—There has been no change in the store price on Cut Nails, the decline in Wire Nails having brought both varieties down to about an even basis. While a moderate reduction would not be unexpected, it is thought that this would cause the market to assume a rather more active appearance.

Chicago.—There is a slightly better demand for Cut Nails, but the improvement is, on the whole, not wide enough to be especially gratifying. To what extent the cut in Wire Nails will effect Cut Nail prices has not been determined by any announcement made in this market, but a new basis for open quotations will doubtless be established. Normally there is a spread of 10 cents a keg between Steel and Iron Cut Nails, but this has widened under the sagging of Steel Cut Nail prices to as much as 20 cents. We quote as the prices current on actual transactions as follows: In car lots to jobbers, Iron Cut Nails, $2; Steel Cut Nails, $1.80.

Pittsburgh.—In sympathy with the recent reduction of 35 cents per keg over the former official price in Wire Nails, it is not improbable that the Cut Nail manufacturers will also make a reduction. At this writing we have not been advised of any official change in prices, which remain on the basis of $1.80 per keg, base, f.o.b. Pittsburgh; but this price has been shaded for some time to the extent of 10 to 15 cents per keg. Demand for Cut Nails is referred to by the mills as being confined to small lots to cover actual needs.

Barb Wire.—The reduction in Wire products, to which extended reference is made under the heading of Wire Nails, is especially drastic in Barb Wire, which has been made $10 per ton lower than the former price, which, however, was at least $2 or $3 above the level at which business was being done. Barb Wire is thus placed on the same basis as Wire Nails, instead of 15 cents per 100 lb. higher, as heretofore. Stock orders are now being received at the mills in large volume. The new quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots	$1.60	$1.90
Retailers, carload lots	1.65	1.95
Retailers, less than carloads	1.75	2.05

Chicago.—The new prices announced by the leading producers effective May 1 fix a basis of $10 a ton below the old schedule, which it replaces. This is the most drastic cut made in any of the commodities effected by the present revision, and was undoubtedly intended to put it at a level from which there would be no tendency to sag. If it meets with the response that the consumptive demand for Fencing seems to warrant, a large increase in new business should result. Revising prices, we quote as follows: Jobbers, Chicago, car lots, Painted, $1.78; Galvanized, $2.08; to retailers, car lots, Painted, $1.83; Galvanized, $2.13; retailers, less than car lots, Painted, $1.93; Galvanized, $2.23; Staples, bright, in car lots, $1.78, Galvanized, $2.08; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Effective May 1, the leading makers, including the American Steel & Wire Company and the Pittsburgh Steel Company, announced a reduction in prices on Barb Wire to the basis of $1.90, f.o.b. Pittsburgh, which is a cut of $10 per ton over the former official price, which was $2.40, f.o.b. Pittsburgh. However, the price of $2.40 had not been strictly observed for some time, Barb Wire having sold at $2.30 and in some cases at $2.25. As with Wire Nails, this cut in Barb Wire had been looked for by the trade for some time, but was heavier than generally expected. The makers state they will not accept contracts for long time delivery at the new prices, but that orders must be accompanied with specifications and will only be accepted for relatively prompt shipments. The mills have been in receipt of a heavy volume of orders since the reduction was made, indicating that stocks in the hands of jobbers and consumers were at a very low level. We quote Galvanized Barb Wire at $1.90 and Painted at $1.60, f.o.b. Pittsburgh, in carloads and larger lots, for prompt shipment.

Plain Wire.—In common with other Wire products, Plain Wire was officially reduced this week, the decline on this commodity being $8 per ton from the former nominal prices and $6 or $7 from the figures at which business was being done. Plain Wire is thus brought to a basis 20 cents per 100 lb. lower than Wire Nails, as compared with a previous differential of 15 cents. The base price, which has formerly covered Nos. 6 to 9, now applies to Nos. 0 to 9, the regular schedule being as follows, f.o.b. Pittsburgh, subject to the usual terms:

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.40	1.45	1.50	1.55	1.65	1.75	1.85	1.95
Galvanized	1.70	1.75	1.80	1.85	1.95	2.05	2.45	2.55

Chicago.—In the revision of prices officially announced by the leading manufacturers as effective May 1, Plain Wire was reduced $8 a ton. A substantial reduction has for some time been foreshadowed by the more or less open under cutting of prices that has characterized the transactions of all interests. Just how deep a cut would be made when the revision was finally decided upon was a subject of conjecture, but it is doubtful if the general run of predictions placed the figure as low as the price announced. We quote revised prices as follows: Car lots to jobbers, $1.58, base, f.o.b. Chicago.

Pittsburgh.—Effective from Saturday, May 1, prices of Plain Wire were reduced by the leading makers to the basis of $1.40, f.o.b., Pittsburgh, which represents a cut of $8 a ton over the former official price of $1.80, but which has not been strictly maintained for some time, Plain Wire having sold in the last several months at $1.75 and lower. The heavy reduction in price, which was larger than expected by the trade, has stimulated demand to a very great extent, and orders are coming into the mills quite freely. As in the case of other Wire products, no contracts will be entered by the mills for future delivery at the new prices, but orders must be accompanied by specifications and for prompt shipments.

Bright Chain.—The Standard Chain Company, Pittsburgh, Pa., under date of April 27, has issued revised list prices on Traces, Cow Ties, &c., which represent a revision by the manufacturers of this class of goods which has been under consideration for some time. In these new lists inequalities in the old list prices are corrected. The new list prices are in general higher than the former lists, but it is understood that discounts are correspondingly revised.

Galvanized Ware.—Greater irregularity has developed in Galvanized Ware. For some time established prices have been cut by some manufacturers, although fairly well maintained by others, who were acting in harmony. It is now understood that the latter will pursue a policy of meeting competition.

Wire Cloth.—The Michigan Wire Cloth Company, Detroit, Mich., which has been marketing its product through the American Sales Company, Chicago, announces that it has terminated its arrangement with the latter organization and is operating independently in the sale of Screen Wire Cloth, as well as Wire Cloth generally.

Shotguns.—Leading manufacturers of Firearms have made a reduction of 50 cents each in the price of Single Barrel Shotguns. The new price to average trade may be represented by a quotation of from $3.75 to $4. per gun.

Taylor Screw Clamps.—Owing to improved methods of manufacturing the James L. Taylor Mfg. Company, Bloomfield, N. J., is now in position to offer the Taylor Screw Clamps at somewhat lower prices, this being done without any sacrifice of quality, which will be maintained as heretofore. The company also states that during the past few years its business has greatly increased, and extending credits to many customers all over the country has added materially to the office expense. Desiring to eliminate this as far as possible and giving customers the benefit of the difference in costs resulting therefrom, the company has decided to offer an extra 10 per cent. for cash with order.

Paris Green.—Leading manufacturers of Paris Green have adopted their prices for the coming season, which represent a decline of 4 cents per pound from last year's figures. The new schedule for Arsenic Kegs is as follows, f.o.b. New York; terms, 30 days, or 1 per cent. 10 days; if f.o.b. Chicago, add ½ cent per pound:

	Per pound.
On orders of 10,000 lb. or over	17 c.
5000 or over but less than 10,000	17½c.
1000 or over but less than 5000	18½c.
500 or over but less than 1000	19½c.
Less than 500 lb	20½c.

The extras are as follows: Kegs of 100 to 175 lb., ½ cent per pound extra; Kits, 14-28-56 lb., 1½ cents extra; Boxes, 2 to 5 lb., paper, 2 cents extra; Boxes 1 lb. paper, 3 cents; Boxes, ½ lb. paper, 4 cents, and Boxes ¼ lb. paper, 5 cents per pound extra.

Rope.—Hopes for early improvement in the Cordage market have not yet been realized, although buying seems to be going on in fair volume, especially as regards the large trade. The opinion is generally expressed that the market can only move one way, and that a further improvement in demand will probably lead to a moderate advance in prices, which, however, are held down by aggressive competition. Pure Manila Rope of the highest grade may be quoted at 8½ to 8¾ cents per pound, according to quantity and class of trade, but "Pure Manila" of somewhat lower grade can be bought for from ¼ to ½ cent less. The market on good Sisal Rope may be represented by a quotation of 7 to 7¾ cents per pound.

Sash Cord.—Some buyers were lead to expect an advance in Sash Cord following the recent conference of leading manufacturers. This did not materialize; but, in a general way, it may be stated that the market is firm and demand is better than for some time. This, however, may be partially explained by the progress of the season. A quotation of 21 to 22 cents per pound for Nos. 8 to 12 may be named to represent the market to average trade.

Window Glass.—Locally the situation as regards demand and prices continues as for some time. In some other parts of the country, notably the West and South and in the Northwest, a little improvement in the demand is reported. A few factories have closed down, but it is understood that some machine plants are considering the advisability of working during the summer, which action would doubtless be followed by hand operated interests. The situation concerning the formation of the Imperial Window Glass Company is no clearer than it has been for two or three weeks. By some its organization is regarded as a necessity and thus certain to come around, while others are not at all hopeful of its consummation. It is said that out of 64 factories approached by the promoters only 29, with a total capacity of 1164 pots, have acquiesced in the proposition, 35 plants, with a total capacity of 1144 pots, being unconvinced or opposed. Machine interests continue to quote 90 and 40 per cent. discount on single and 90, 40 and 10 per cent. discount on double strength. Eastern jobbers are holding Glass at 90 and 35 per cent. discount on single and 90 and 40 per cent. on double strength.

Linseed Oil.—The market has a strong tone, and the competition from second hands is not so keen as heretofore. An advance in price has been looked for, but has not yet materialized. Seed is higher and scarcer, and stocks of Oil, notwithstanding the moderate demand which has prevailed, have not, it is thought, accumulated to any marked extent. Regular quotations in 5-bbl. lots are as follows: State and Western Raw, 55 cents per gallon; City Raw, 56 cents per gallon. Boiled Oil is 1 cent advance on Raw.

Spirits Turpentine.—The demand during the past week has been of rather small proportions, with little fluctuation in quotations. The New York market is represented by the following quotations: Oil Barrels, 39 to 39½ cents; Machine Made Barrels, 39½ to 40 cents per gallon.

REUBEN B. ESTEN has resigned his position in the New York branch of E. C. Atkins & Co. to become manager of the New York headquarters of the Clinton Wire Cloth Company at 261 Broadway. Mr. Esten began his service with E. C. Atkins & Co. in 1892 in Memphis, and had been identified with the New York office since 1901. The Clinton Wire Cloth Company, in addition to its lines of Wire Cloth, Netting and Fencing, manufacture Lath, electrically welded fabrics and perforated metal for all purposes.

J. M. SHERWOOD, sales manager of the Bridgeport Chain Company, Bridgeport, Conn., has resigned that position to accept the sales managership of the mechanical department of the New York branch of the Diamond Rubber Company.

Hardware Millinery.

The Window Display That Set a Town Agog.

FROM A SPECIAL CORRESPONDENT.

FEMININE headgear for this spring might make the angels weep. It is a fit subject for all the satire heaped upon it, and the hardest—or Hardwarest—blow dealt it was in Los Angeles, Cal. Just before Easter the windows of the Cass-Smurr-Damerel Company blossomed out in chapeaus fashioned from inverted Coal Scuttles, Cuspidors, Wash Basins, Colleuders, Pudding Dishes, Flower Pots, Chimney Stoppers and Wooden Chopping Bowls, and also "made" hats of Rope, Sandpaper and Tin Sheeting.

The writer ventures the assertion that every intelligent person in Los Angeles either saw or heard of that display and will remember the name of the firm making it. It was as current a matter of local conversation as Taft's going to a baseball game was national. All men saw the joke, and most women—unless they happened to be *Hardware* hit. "It's perfectly horrid and ought to be stopped," snarled a woman whose headgear bore a ludicrous resemblance to an inverted elliptical Chopping Bowl ornamented with Rope and trimmed with a small Feather Duster nattily placed on the north-northwest corner.

In the center of the window, on the waxen head of a borrowed model, was placed a wonderfully constructed hat of Rope, decorated with fringed ends of the same and two large Screwdriver hatpins. Below was displayed a stunning, though stiff, creation evolved from a Pudding Dish decorated with a large Stirring Spoon, two Egg Beaters and a turquois studded Dog Collar. A Coal Scuttle model, the handle of which served for a coquettish chin string, was extremely fetching. It was encircled by a Cat Collar and bewitchingly trimmed with a rakish Dish Mop pompon.

A single Lamp Swab chastely set off the Cuspidor; a whirling Egg Beater decorated the Wash Basin; a haughty looking Scrubbing Brush adorned the Wire Colander; two Whisk Brooms looked amazingly like Mercury wings on a Tin Chimney Stopper, and so on.

Such crowds surrounded the window that no little diplomacy was required to obtain the photographs from which our reproductions were made. No other window display, however expensive and beautiful, ever made in Los Angeles, was so gazed at, or so talked about, as this one. The firm has wisely returned to a display of straight goods, realizing that those in such a heavy business as the Hardware line are not expected to cut capers and monkeyshines every day. People who come now to look at freak millinery remain to inspect Hardware—just Hardware.

Easter Window Display of the Cass-Smurr-Damerel Company, Los Angeles, Cal.

A Hardware Store Millinery Exhibit.

The New York Leather Belting Company, 51 Beekman street, New York, is issuing monthly an attractive house organ, called "The Phœnix." It is published "in the interest of good Belting and its use," and is effectively got up and illustrated. In the April number, recently issued, the leading article is entitled, "Is Belting Trouble a Necessity?"

The Prescott Hardware Company, Prescott, Ark., is establishing a branch house at Murfreesboro, Ark., under the management of John Brown, handling Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Agricultural Implements, Paints and Oils, Sporting and Athletic Goods.

A new Hardware business has been established at Virginia, Minn., under the name of the Virginia Finish Hardware Company, which will carry a line of Shelf and Heavy Hardware, Sash, Doors and Farming Implements. The business will be managed by M. J. Lofback.

The McGregor Hardware Company, Temple, Texas, capitalized at $20,000, has succeeded the Brown-Arnold Hardware Company. The new organization is headed by William F. McGregor, president, with whom are associated Joel F. McGregor and R. L. Brown.

The Black-Walker Hardware Company, Brackenridge, Texas, has recently been incorporated, with a capital stock of $17,200, the incorporators being William Black, Jack Black, W. C. Veale and E. H. Webb.

C. W. Rector, Cameron, W. Va., has become associated with the Sinsel Hardware Company of that place.

DEATH OF S. B. BISPHAM.

S. B. BISPHAM died at his home in Charlotte, N. C., April 28, after an illness of but one week. Although his death came as a shock, to intimate associates it was hardly a surprise, some of whom were cognizant of an ailment which had overtaken him some months ago.

Mr. Bispham was born about 60 years ago in Warrenton, Va., and had represented the Russell & Erwin Mfg. Company for approximately 20 years in Southern territory, extending from Virginia to Florida, and taking in the Atlantic Coast States.

Previous to his connection with Russell & Erwin, he was in the Hardware business in Baltimore for ten years, and during the Civil War rode with Col. John S. Mosby

S. B. BISPHAM.

and his rangers. He married a niece of the Confederate general, A. P. Hill.

He was a man of strong personality, high ideals, sterling principles and of modest demeanor. He won and retained the respect and confidence of his associates and all who knew him because of his ability, loyalty and genial disposition. He was a member of the Masonic order, and is survived by his widow, a daughter and two sons, one of whom is a surgeon-major in the United States regular army and the other a lawyer located in Muskogee, Okla.

THE GRAND CROSSING TACK COMPANY, Grand Crossing, Ill., advises us that the reports which appeared in the daily press concerning damage to its plant during the storm which visited that section on the 29th ult. were very much exaggerated. Only trifling damage was done to the company's operating departments, and things are running as usual, all specifications being promptly shipped.

THE "GOOD TIME INSURANCE COMPANY," otherwise the Southern Hardware Jobbers' Association, is sending out an attractively printed "policy," in which it agrees to give the recipient "the time of his life" if he is in attendance at the annual meeting of the association at the Hotel Schenley, Pittsburgh, Pa., June 9-11. The document is signed by W. T. Sanford and John Donnan, president and secretary, respectively.

THE valuable paper on the subject of "Bookkeeping and Fire Loss Adjustments" read by John B. Lee, Jr., at the last annual meeting of the Minnesota Retail Hardware Association, has been reprinted in booklet form, and copies may be obtained from M. S. Mathews, secretary, Metropolitan Life Building, Minneapolis.

CONTENTS.

Cost System and Shop Control.

Concluding Article.

In the first article, given in our last issue, emphasis was laid on the importance of an intelligent system in providing an accurate knowledge of costs and affording comparisons by which a practical factory man can effect cost reduction by preventing waste of material and keeping track of productive and nonproductive labor. The concluding article deals with the more abstruse matters of general factory and selling expense. As already noted, these articles are based on an address made by B. A. Franklin, Miller & Franklin Company, Boston, Mass., and Pittsburgh, Pa., at the last annual convention of the American Hardware Manufacturers' Association.

FACTORY EXPENSE.

It is in this third element, factory expense, where the situation gets beyond and away from most manufacturers. And yet this element, with proper handling, is the most easily obtained and most readily controlled of the elements of cost. The first item in the consideration of expense is to show it in relation to some definite factory element, and this element is productive labor. How many cents does it take to keep a dollar's worth of productive labor at its maximum efficiency, is the vital question. It is only by this knowledge that factory expense really begins to mean something definite and significant. And the mistake should not be made of taking this in the factory as a whole, but each department should have its per cent. of expense to productive labor shown separately. Thus the expensive departments are picked out, and definite basis is offered monthly for criticism and correction.

Relation to Productive Labor.

Expensive Departments.

EXPENSE ANALYSIS

ITEMS	INVENTORY EXPENSE SUPPLIES	January 1907. ACTUAL	January 1907. USED	February 1907. ACTUAL	February 1907. USED
GENERAL EXPENSE					
OFFICE					
Executive		1500.00		1500.00	
Cost and Bookkeeping		937.00		96580	
Other Clerical		361.54		308.14	
Stationery		187.21		105.13	
Postage		51.66		280.56	
Telephone		43.10		51.25	
Telegraph		9.60		9.50	
Legal		75.00		50.00	
Sundries		5.61		6.67	
TOTAL		3106.72	3105.72	3099.55	3099.55
% to Total Expense		7.1%		6.9%	

Fig. 5.—Expense analysis sheet, showing office disbursements, which are classified under general expense. This is a page from a loose leaf book devoted to expense analysis, the pages being uniform and large enough to afford space for 12 or 24 months' totals according to requirements. In this particular department the headings "actual" and "used" are unnecessary, but their significance will be clear from sheets referring to other departments. Obvious advantages are gained by such comparisons of monthly totals as are made possible in this way. For instance, there is a noteworthy increase in postage and telephone charges; it may be all right, but it should be looked into. Some items decrease materially, perhaps because February is a shorter month. A comparison suggests, however, that perhaps the January expenses were too high, and they may be kept down nearer to the February level.

Figures That Tell Things.

Fig. 5 illustrates this expense showing very well. It will be noted that month after month not only is such a detail of expense shown as is most instructive as to where the money is going; but, what is really to the point, these figures are brought to per cents. in each department, and it is these per cents., in going up or down, that tell in a few figures the significant point of expense.

Clerical Labor Not Considerable.

It might be thought, from a glance at these expense forms, that such knowledge would be costly in clerical labor to obtain; but, as a matter of fact, it is really very simply obtained, and there have been very few cases in my knowledge where the bookkeeper was not able to furnish these facts monthly in addition to his other work.

Information for the Practical Man.

But it is well to note the really valuable information this expense analysis furnishes, especially to the practical man, who needs and can use it. It should be thoroughly understood that the practical man finds it very difficult, not only to pore over, but to understand and to correlate the facts to his process of operation. This analysis gives these valuable results:

1. It enables him to see, in a few per cents. from

EXPENSE ANALYSIS

ITEMS	January 1907. ACTUAL	January 1907. USED	February 1907. ACTUAL	February 1907. USED
GENERAL EXPENSE				
GENERAL FACTORY				
Executive	600.00		600.00	
Clerical	116.27		104.15	
Storeroom	66.00		66.00	
Cleaning	169.34		193.21	
General Labor	449.07		341.90	
Inward Cartage—Freight	261.03		240.60	
Inward Express	39.17		28.80	
TOTAL	1731.88	1731.88	1596.66	1596.66
% to Total Expense		9.1%		8.6%

Fig. 6.—Expense analysis sheet, showing general factory expense, also classified under general expense. This is the same form and from the same loose leaf book as Fig. 5. A reduction of the percentage of this charge to the total expense is always to be worked for, and is shown at the foot of the sheet under "% to total expense."

EXPENSE ANALYSIS

ITEMS	INVENTORY EXPENSE SUPPLIES	January 1907. ACTUAL	January 1907. USED	February 1907. ACTUAL	February 1907. USED
GENERAL EXPENSE					
SHIPPING					
Labor		521.60	521.60	467.19	467.19
Lumber	1526.11	966.11	436.10	513.39	389.50
Nails		100.31	100.31	10.16	10.16
Supplies		47.66	47.66	59.31	59.31
TOTAL	1526.11	1635.38	1096.37	1049.05	926.16
% to Total Expense			2.9%		2.5%

Fig. 7.—Expense analysis sheet, showing the expense of the shipping department, also a part of general expense. Here the headings "actual" and "used" are necessary, the former showing what was purchased and the latter what was actually used. When inventory of supplies is taken it is possible to balance the total purchases with the amount used and the amount on hand. The figures might lead to an investigation as to whether the stock of lumber is not unnecessarily large and purchases might be cut down.

EXPENSE ANALYSIS

ITEMS	INVENTORY EXPENSE SUPPLIES	January 1907 ACTUAL	January 1907 USED	February 1908 ACTUAL	February 1908 USED
TOOL ROOM					
Files		27.30		5.40	
Drills		124.50		14.46	
Hacksaws				50.00	
Emery Wheels		50.00		18.25	
Taps		40.00			
Cutters				121.60	
Reamers		12.60			
Tool Steel		46.27			
Miscl. Supplies		10.11		14.67	
Labor Sharpening Tools		187.30		150.40	
Making "		240.94		304.69	
Total Expense		640.56	640.56	679.47	679.47
Amount charged to					
Screw Machine Dept.			120.46		197.14
Machine "			440.29		320.16
Assembling "			36.21		129.14
Undivided Portion to General Expense			44.60		32.99
% to Total Expense			21.7%		21.7%

Fig. 8.—Expense analysis sheet, showing toolroom expense. Various amounts are charged as withdrawn to the different departments, and the undivided portion, $44.60, is charged to general expense (see Recapitulation, Fig. 9). A similar record is kept of repairs.

month to month, how the expense part of the game fluctuates, and why.

2. It gives him a chance to judge each department of itself, and by per cents. in both productive and nonproductive departments and gives him an opportunity to discover whether expense is increasing or decreasing in relation to the whole situation.

3. General expenses can be sorted out from direct or

EXPENSE ANALYSIS

Recapitulation of General Expense

ITEMS	January 1907 ACTUAL	January 1907 USED	February 1907 ACTUAL	February 1907 USED
GENERAL EXPENSE				
TOTALS				
Office		3366.64		2394.55
Drafting Room		661.16		556.21
General Factory		1731.02		1556.26
Shipping		1096.34		966.06
Pattern Dept.		610.32		763.98
Undivided Tool Room Expense		44.60		32.99
" Repairs Expense		17.90		20.76
Grand Total General Expense Month		7516.93		7196.71
" " " " Period				14712.64
Prod. Labor for Month (All Depts.)		10205.65		9426.07
" " " Period				19632.72
% of Expense to Prod. Labor Month		73.65%		76.35%
" " " " " " Period				74.97%

Fig. 9.—Recapitulation of general expense, showing collected monthly totals from the different departments. The sheets covering drafting room, pattern department and repairs expense have not been shown in this article, but would be similar to those which have been reproduced. The items, "Undivided toolroom expense" and "Undivided repairs expense," represent that portion of the expense in those departments which was not charged to the departments served, as explained under Fig. 8. Following the recapitulation are shown the grand totals of general expense and productive labor by the month or for longer periods, and the percentage of expense to productive labor, which the factory man is always working to keep down.

EXPENSE ANALYSIS

Memorandum of Supply Purchase and Use

ITEMS	INVENTORY EXPENSE SUPPLIES	January 1907 ACTUAL	January 1907 USED	February 1907 ACTUAL	February 1907 USED
GENERAL SUPPLIES					
Oils	350.60	58.47	210.17	126.41	190.10
Electric Lamps	105.00	10.28	35.40	25.46	10.15
Sundry Supplies	450.20	10.46	113.20	395.57	125.16
TOTAL	905.80	79.21	358.77	547.44	326.41

Fig. 10.—Memorandum of general supplies purchased and used each month. This table in itself does not represent a part of expense, being merely a memorandum made up from reports from all departments, representing charges there made to department expense. These data, however, are collected to give a general line on the supplies used in the entire plant.

department expenses, so that increase or decrease can be noted.

4. It offers a magnificent comparative detail looking to expense, control and reduction.

5. These per cents. afford also a definite method of adding expense to each article, when we know the productive labor on it, and, given by departments, it offers a definite way of knowing of one article that goes through certain departments, its variation in cost from another article that goes through other departments, or even in proportion to other articles in the same department.

SELLING EXPENSE.

The fourth element to be controlled is the selling expense. This, as is seen, is shown in relation to the sales in a per cent., which means the showing of the number of cents it takes to make a dollar's worth of sales. This fact may be shown as to different territories, or even of different salesmen, although it is perfectly plain that no absolute comparison may be made between territories because of different conditions.

Relation to Sales.

Summarized Advantages of System.

Thus briefly, as may be seen, through such a system, if carried out as it can undoubtedly be, and in most cases with no increase whatever of clerical labor, the practical man gets control of the situation. He knows the cost of his articles in a proved way, so that when he sells them he makes a known profit, or, if he is losing, he does it deliberately.

In *Material* he knows when it costs him more per 100 pieces than the standard, and he knows the wastes.

In *Labor* he increases his production, betters his qual-

EXPENSE ANALYSIS

ITEMS	INVENTORY EXPENSE SUPPLIES	January 1907 ACTUAL	January 1907 USED	February 1907 ACTUAL	February 1907 USED
POWER					
Labor		561.29	561.29	497.16	497.16
Coal	10096.25	1064.26	661.46		1047.26
Water		1200.00	100.00		100.00
Oils	426.60	120.46	156.64		106.67
Sundry Supplies		47.20	47.20	24.71	24.71
TOTAL	10522.85	2993.21	1526.59	521.87	1775.80
% to Total Expense			12.64%		13.92%
% to Screw Machine Dept	10.0%		179.46		166.07
" " Machine	46.5%		503.20		522.81
" " Assembling	13.0%		231.23		237.69

Fig. 11.—Expense analysis sheet, showing the power expense and the percentages apportioned to different departments, which if complete would when added equal 100 per cent., or the total amount of power. The principal item, of course, is coal, a very large stock being carried and monthly purchases and consumption being far out of line.

EXPENSE ANALYSIS

ITEMS		January 1907 ACTUAL	January 1907 USED	February 1907 ACTUAL	February 1907 USED
Depreciation		1200.00	1000.00		1000.00
Taxes		6000.00	500.00		500.00
Insurance		2400.00	200.00		200.00
TOTAL		20400.00	1700.00		1700.00
% to Screw Machine Dept	10%		170.00		170.00
" " Machine "	40%		680.00		680.00
" " Assembling "	30%		510.00		510.00
" " Other Depts	20%		340.00		340.00
	100%				

Fig. 12.—Expense analysis sheet, covering depreciation, taxes and insurance, and showing their apportionment to the different departments. The totals as charged off for the year are shown in the "actual" column for January, one-twelfth being entered up as "used" each month.

ity, reduces his costs and controls the situation, either by piece work or by a definite knowledge of the operation costs in day work.

In *Expense* he gets a complete, simple, but cost reducing view, both of the factory and selling expense.

Value of Co-operation.

But he can get still better results and control, if he will do that which makes a system really valuable—viz., get into the game with him all of his subordinates and foremen, show the foremen monthly the expense of their departments, their wastes weekly, their nonproductive labor and daywork weekly, and let everybody all along the line know when these don't go right.

EXPENSE ANALYSIS

ITEMS	INVENTORY EXPENSE SUPPLIES	January 1907 ACTUAL	January 1907 USED	February 1907 ACTUAL	February 1907 USED
Machine Dept					
Non-Prod. Labor Oversight		345.10	345.10	491.60	491.60
Gen. Non-Prod. Labor		184.16	184.16	194.15	194.15
Oil		26.18	26.18	37.19	37.19
Castings for Repairs		145.00	145.00		
Trucks		50.00	50.00	2500	2500
Sundry Supplies		44.90	44.90	13.66	13.66
Total Direct Dept. Expense		773.92	773.92	997.40	997.40
Share of Tool Room Expense			490.29		350.16
" " Repair			704.65		341.90
" " Power			901.80		814.81
" " Depreciation, Taxes and Insurance			680.00		680.00
Total Dept. Expense Month			3551.16		3384.35
" " " Period					6935.51
Prod. Labor Month			2231.60		2567.15
" " Period					4798.75
% Exp. to Prod. Labor Month			159.25%		131.8%
% " " " " Period					80.98%
% Gen'l Exp. to Prod. Labor Month			73.69%		74.36%
% Gen'l Exp. to Prod. Labor Period					74.97%
% Cost Exp. to Prod. Labor Month			159.25%		155.17%
% Cost Exp. to Prod. Labor Period					155.95%

Fig. 13.—Example of department expense sheet, showing direct expense, share of expense from other departments, total department expense, total productive labor for the department, &c. In comparing the January and February entries it would be remembered that the latter is a short month. The department per cent. of expense to productive labor (in January 85.56 per cent.) added to the per cent. of general expense to productive labor (in the same month 73.69 per cent.) gives the per cent. of total cost expense to productive labor for the month, or 159.25 per cent. On anything produced in the machine department, then, 159.25 per cent. must be added to the productive labor to get the cost. A considerable decrease in department expense is shown for February, reducing the average for the two months, or period as entered, to 80.98 per cent. The average general expense for the period is 74.97 per cent., and the average total cost expense 155.95 per cent., as entered.

A right cost system will bring economy and a better selling basis. The manufacturer is afraid of a complete and accurate cost system, and of system in general, because of red tape, clerical labor, &c., but he need not necessarily be. A true, accurate, discriminating, cost reducing system can be introduced, that means real money and without much clerical labor, if done by practical men. In fact, I have seen cost systems put into operation with a decrease of clerical labor, and a right cost system always pays.

Problem Can Be Solved.

Competition is more and more compelling manufacturers to have this knowledge, and, while there are many successful concerns which to-day have no real system of costs, nevertheless there are many more that have made their success greater or surer by a constant and accurate knowledge of the costs. And the day is coming when no manufacturer can afford to be without a cost system which will prove with his books.. And yet again, as a last word, because this is the bugaboo that still stands between the manufacturer and a right cost system—these methods, if properly installed and applied, do not mean red tape or large clerical labor, but they do mean cost reduction, right profits and plant control. As one manufacturer recently expressed the situation, when these methods were working successfully in his plant, holding up his hand and closing it, "I've got my plant right there."

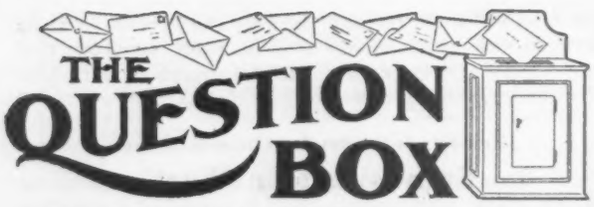
No Red Tape Bugaboo.

SELLING EXPENSE

ITEMS	January 1907	February 1907
Executive	750.00	750.00
" Traveling	291.75	312.96
Salesmen's Salaries	550.00	587.46
" Expenses	207.25	196.43
Advertising	50.00	62.50
Office Expense	49.60	55.40
Telegrams	10.50	9.60
Entertainment	38.75	52.16
Commission	402.50	390.25
Cash Discounts	360.92	360.40
Outward Freight	27.40	29.34
" Express	22.96	24.71
Telephone	15.95	15.30
Sundry Expense	20.96	10.45
TOTAL	2783.54	2965.29
Total Sales	40000.00	36000.00
% of Selling Expense to Sales	6.9%	7.35%
Period % " " " "		7.1%

Fig. 14.—Monthly totals of selling expense. Fluctuations in these items are of great significance and would be looked into with care. For instance, the disbursement for entertainment increases from $38.75 in January to $52.16 in the succeeding month. The table also gives a comparison of total selling expense to total sales, both by the month and for longer periods.

The Boddeker-Lyon Hardware Company, Galveston, Texas, recently incorporated with a paid-in capital stock of $15,000, will operate a wholesale and retail Hardware store, giving special attention to Carpenters' Tools, Builders' Hardware and Cutlery. The company is officered as follows: R. A. Lyons, Jr., president; James A. Boddeker, secretary and treasurer, and E. H. Compton, vice-president.



This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

QUESTION No. 13. *The inquiry discussed in part in our last issue has called out several suggestive communications in which our correspondents consider the advisability of*

Selling Stock to Farmers.

The proposition seems to most of the merchants who have written in reply a somewhat radical and unusual one, but it is of a good deal of practical interest as touching on the important question as to measures which can be used to secure the farmer's trade.

A Comprehensive View of the Subject

is taken by a wise and clear thinking merchant in Oklahoma, who argues it out with an eye to possible results which might not be immediately thought of. His valuable contribution to the discussion is as follows:

Regarding whether it would pay to incorporate, I would say that it depends largely on the individual case. If a man owns and manages his business incorporation is not necessary. If the business is a partnership affair by all means incorporate, and especially so if one expects to take in outside stockholders. I do not believe it would be a good thing to sell stock to farmers for several reasons. As I understand it, the idea is that you will gain their trade and good will by having them interested in the business financially. A merchant will have to have their confidence to a large degree before they will buy stock in his business. If he has their confidence and will manage his business properly he will have their trade and good will without selling them any stock.

Confidence a Necessity Anyway.

Relations with Stockholders.

Any farmer buying stock of $100 to $300 in a business will not be very much interested in the business. A merchant will have to treat him about the same in order to hold him as a customer that he would a nonstockholder. And among stockholders in such a business there would be some who would give no end of trouble if things were not done "their way." Many of them would want their goods at cost or less than the regular price. Let any merchant take 25 or 30 of his best customers out of his profit column and the result would not be gratifying, to say the least. And it would be woe unto the manager if he should sell an article to a nonstockholder 5 cents cheaper than he sold the same article to a stockholder only a few days before, if Mr. Stockholder found him out.

Demands Would Be Unreasonable.

This is the age of corporations and stock selling schemes. It is frequently resorted to, to good advantage, by banks; but bank and Hardware stock is entirely different. The banking business is regulated and governed by State and national laws. The average farmer knows very little about banking and finance. As long as his stock is worth par or above and he is receiving his dividend regularly, he is satisfied. But he knows more about Hardware and Implements, and if a little dead stock accumulated, or the manager bought too heavily and had to carry over a carload or two of unseasonable goods, he might join the hammer brigade and his stock would probably be for sale. The most troublesome stockholder in any corporation is the small stockholder. This has always been the case and always will be. It is the result of natural laws and conditions.

Bank Stock vs. Hardware Stock.

Small Stockholders Most Troublesome.

A Far Better Way

of putting new life into and helping one's business would be to sell $500 or $1000 of stock to each of four or five live, energetic, honest young men, and take them into the business. They could not all be found in a day or perhaps in a year, but they could be found. If they are of the right stuff and do not have the money, sell them the stock on time, to be paid for out of their salary and out of the profits on the stock. Let them grow up in the business, learn it thoroughly, become accustomed to your methods of doing business, and in a few years they will be just as anxious for the success of the business as you are. I would far rather have stockholders of this kind than to have a large number of farmers interested in a small way. Any man who will organize his business in this matter, making it a profit sharing institution in a way, will reap greater benefits than on the farmer stockholder plan. I can see how the latter method would prove successful in some few cases, but there would be so many cases where it would prove disastrous that it would not pay to take the risk. But let any man who does not want to see his business grow and develop rapidly and his profits increase daily, beware of the salesman stockholder or profit sharing plan, for under it I am satisfied the business would grow in spite of him.

Getting in Young Blood.

Profit Sharing Promises Growth.

Uniform Size of Invoices.

Answers to Question No. 5 quoted in our issue of April 15, relating to uniform size of invoices, &c., indicated that some merchants are disposed to favor the suggestion as a theoretical idea, although the difficulty, and indeed impracticability, of carrying it out were more generally recognized. The point was well made by several correspondents that the matter was of minor importance compared with the many serious and vital problems that are pressing merchants for solution. The following additional answers have been received from the States designated:

IOWA: It is out of the question that this should ever be done, although in a few instances invoices of extreme width might be cut down to allow filing without folding under.

Holding to Individuality.

An alert correspondent in Indiana with an original way of looking at things pertinently remarks that he believes in doing some things to suit himself. "When a house does this," he says, "it loses its individuality." Not only is this true, but it suggests the further consideration that people in business learn to distinguish the stationery of many of their correspondents by slight peculiarities of form, color, &c., and find much convenience in so doing.

It might even be that the convenience of having business documents all the same size might be more than offset by having them all look alike.

Favorable Expressions.

On the other hand a number of favorable expressions have been received—some brief, like the following:

INDIANA: It would be of special convenience to jobbers and manufacturers.

THE QUESTION BOX CONTINUED

WISCONSIN: No doubt something could be done, as some of the blanket sheets are a nuisance. Then for loose leaf binders, a uniform width would be a nice thing.

LOUISIANA: It would be more convenient for filing and indexing letters and invoices.

IOWA: A good idea—worth pushing.

More Definite Suggestions.

A few merchants write at some length indorsing the idea and giving definite arguments supporting it.

FROM AN OHIO CONCERN: We would certainly approve of such a move, for in our own office we are tried beyond our patience with the many shapes, sizes and widths of the various invoices we receive during the day, and if we could file our monthly reports with the invoices of uniform width it would certainly be a great convenience.

Trying to the Patience.

FROM AN IOWA MERCHANT: Uniformity of invoices would be a good thing. The average width of billheads is about 8¼ in. This size allows of a number of invoices being pasted on one sheet in invoice book, whereas the wide ones (we have had them as wide as 10½ in.) take up an entire page. I don't think that the size of letterheads and statements make much difference, barring, of course, the abnormally large ones.

Applied to Invoice Books.

MAKING GOOD IN BUSINESS

HINTS AND SUGGESTIONS FROM MANY SOURCES

The Day's Work.

The day returns and brings us the petty round of irritating concerns and duties. Help us to play the man. Help us to perform them with laughter and kind faces. Let cheerfulness abound with industry. Give us to go blithely on our business all this day, bring us to our resting beds weary and content and undishonored, and grant us in the end the gift of sleep. *R. L. Stevenson.*

Imagination.

A Faculty of Practical Use in Business.

IMAGINATION is a valuable thing; and even if it were not it is a thing, a real thing, a faculty which everyone has, and with which you must do something. I know that many, especially men of business, are inclined to sneer at it and ask what is the use of it. You will find that in practice, in action, in business, imagination is a most useful faculty, and is so much mental capital, whensoever it is properly trained. Consider but this one thing: that without imagination no man can possibly invent the pettiest object; that it is one of the faculties which essentially raises man above the brutes by enabling him to create for himself; that the first savage who ever made a hatchet must have imagined that hatchet to himself ere he began it; that every new article of commerce, every new opening for trade must be arrived at by means of imagination; by the very same faculty which the poet or the painter employs, only on a different class of objects. Remember that this faculty is present in some degree in every mind of any power, in every mind which can do more than follow helplessly in the beaten track and do nothing but what it has seen others do before.—*Charles Kingsley.*

Enthusiasm in Work.

The unprogressive man sometimes works hard in the wrong direction because he thinks it is the right one. More often his failure to get ahead is due to the fact that he does not bring all his powers and enthusiasm to bear upon the work in hand. His whole heart is not in his task. It matters not to him that the world needs to have the work done—he thinks only of his own immediate comfort, and in so doing loses the great reward which the world pays to its real helpers—the joy of a useful life.—*W. P. Warren.*

Rush Your Opportunities.

"Speaking of being alive to opportunities," said "Philosopher Phil" to a crowd of loungers in Grant Park as narrated by John A. Morris in the Chicago *Tribune*, "reminds me of how a Chicago boy got a job in that city several years ago. He had applied at many places where he thought boys might be wanted, but 'No' always had been the answer. On his way home he stopped on a side street where a crowd was trying to look into the window of a gayly decorated store. Happening to gaze upward he saw a boy about his own age and size leaning far out of a fifth story window curiously inspecting the crowd below and trying to see what was going on.

"'Look out dere, you!' he shouted, quickly, 'you'll fall out!'

"He had scarcely finished speaking when the boy above lost his hold on the window sill and fell to the sidewalk below.

"Without waiting to view the mangled remains, this Chicago 'kid' marked the place with his eye, took the elevator, and was soon on the fifth floor.

"Arriving at the proper place, he inquired for the manager. Being told the manager was busy, the boy said he'd wait awhile.

"After a few minutes the manager came out of an inside office and Jimmy struck him for a job.

"The gentleman smiled pleasantly.

"'No,' he said, 'we have one office boy, and that is all we need at present.'

"'Yep!' said Jimmy, not dazed in the least, 'but it seems to me I ought to be it. The boy wot you had fell outer der winder a few minutes ago. He's dead, an' I cum to get der sit.'

"As investigation proved the truth of his words, he was hired.

"Now," went on the philosopher, looking at his finger nails attentively, "this story may sound heartless, but that boy was alive to opportunities. The first boy was dead and some one had to have the job, and if Jimmy had waited for the firm to ascertain its loss and advertise for another office boy and then applied he might not have obtained the situation."

NUMBER 2 of "Plymouth Twine News," the little publication issued by the Plymouth Cordage Company, North Plymouth, Mass., and devoted to Binder Twine, refers at some length to the advertising campaign for the benefit of the trade which is being inaugurated by the company. A list is given of nearly 50 farm papers in which space is being used, and a number of effective electrotypes are shown which will be furnished gratis to merchants carrying the line. The cuts are mortised to accommodate the merchant's name and address.

THE FUHRMAN-MARTIN HARDWARE COMPANY, Elmira, N. Y., has been incorporated to succeed the Fuhrman Hardware Company. B. E. Martin, who has been connected with the business, now becomes a half owner of it.

Hardware Organizations.

Coming Hardware Conventions.

MISSISSIPPI RETAIL HARDWARE ASSOCIATION, May 11 and 12, at Jackson. Headquarters at Edwards House. Convention in Senate Chamber. Secretary, Jno. E. Sommers, Clarksdale.

ALABAMA RETAIL HARDWARE ASSOCIATION, May 12, 13 and 14, at Birmingham. Headquarters at Hotel Hillman. Secretary, L. G. Smith, Ensley.

GEORGIA RETAIL HARDWARE ASSOCIATION, May 18, 19 and 20, at Valdosta. Secretary, E. E. Dekle, Valdosta.

NATIONAL RETAIL HARDWARE ASSOCIATION, May 25-28, Milwaukee, Wis. Headquarters at Hotel Pfister.

AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION, June 9, 10 and 11, at Pittsburgh. Headquarters at Fort Pitt Hotel.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION, June 9, 10 and 11, at Pittsburgh. Headquarters at Hotel Schenley.

ARKANSAS RETAIL HARDWARE ASSOCIATION, June 22, 23 and 24, at Fort Smith. Hardware Exposition at Tabernacle Hall. Secretary, W. L. Harlan, Little Rock.

CAROLINAS RETAIL HARDWARE ASSOCIATION, July 6, 7 and 8, at Asheville, N. C. Headquarters and Hardware Exposition at the Battery Park Hotel. Secretary, T. W. Dixon, Charlotte, N. C.

SOUTH CAROLINA RETAIL HARDWARE ASSOCIATION, Charleston, in July, the exact date not having yet been determined. Secretary, Paul McLure, Greenwood.

MICHIGAN RETAIL HARDWARE ASSOCIATION, August 11, 12 and 13, at Saginaw. Hardware Exposition at the Auditorium. Headquarters at Hotel Vincent. Secretary, A. J. Scott, Marine City.

FLORIDA RETAIL HARDWARE ASSOCIATION, October 12, 13 and 14, at Jacksonville. Secretary, W. K. Jackson, Lakeland.

Mississippi Retail Hardware Association.

As a reminder of the annual meeting to be held at Jackson, May 11 and 12, the Mississippi Retail Hardware Association is sending out a postal giving a view of the new capitol, the Senate Chamber of which will be the scene of the business sessions of the convention.

Alabama Retail Hardware Association.

The entertainment side of the annual meeting of the Alabama Retail Hardware Association at Birmingham, May 12 to 14, will be adequately looked after by the jobbers and manufacturers of the city, who will extend a warm welcome. In addition the association itself will give a smoker, which promises to be a very enjoyable affair. Among prominent Hardwaremen who will be present at the convention and make addresses are W. D. Simmons, president of the Simmons Hardware Co., St. Louis; R. W. Shapleigh, vice-president of the Norvell-Shapleigh Hardware Co., St. Louis; M. L. Corey, secretary of the National Retail Hardware Association, and C. A. Peck, secretary of the Wisconsin Retail Hardware Association, and of the Wisconsin Retail Hardware Mutual Fire Insurance Company.

Georgia Retail Hardware Association.

A very elaborate programme has been prepared for the fourth annual convention of the Georgia Retail Hardware Association at Valdosta, May 18 to 20. The association numbers more than 400 members, and a large proportion of them have already indicated their intention of being present. It is also understood that many manufacturers will be represented at the meeting, some of them with exhibits. Many formal papers on interesting and practical topics will be read, among them the following: "Forty Years in the Retail Hardware Business," by James Watt, Thomasville; "Relation of Traveling Salesman to the Retail Trade," by R. L. Wylly, Thomasville; "How Proprietors Should Treat Clerks," by W. W. Robinson, Dublin; "How to Conduct a Retail Hardware Business Successfully," by P. N. Harley, Waycross, and "Should We Allow Clerks to Do the Buying, or Should the Manager or Proprietor Do It?" by C. W. Thomas, Griffin.

Other topics of discussion will be the following:

1. "The Best Methods of Collecting Farm Accounts and City Bills," by John R. Hall, Moultrie; H. C. Briggs, Valdosta; C. W. Thomas, Griffin, and C. M. Tillman, McRae.

2. "Does It Pay the Retailer to Buy in Large Quantities, or Does It Pay to Buy Often?" by R. W. Hatcher, Milledgeville, and P. N. Harley, Waycross.

3. "Is It Fair for the Fence Manufacturers to Sell the Same Brand to More Than One Dealer in the Same Town?" by G. W. Woodruff, Winder; J. B. Tillman, Quitman; J. J. Golden, Tifton; R. W. Hatcher, Milledgeville, and John Watt, Waycross.

4. "Should the Ammunition Association Sell the Wholesale Grocers?" by W. W. Robinson, Dublin, and Thomas W. Brodston, Atlanta.

5. "Relation of Jobber and Retailer," by W. A. Parker, Atlanta, and W. D. Krenson, Savannah.

6. "The Bankrupt Law of To-Day," by R. W. Hatcher, Milledgeville; G. W. Woodruff, Winder; J. J. Golden, Tifton, and W. G. Raines, Statesboro.

In addition there will be addresses by L. A. Dietrich, American Steel & Wire Company, New York City, on "The Financial Conditions of the South To-Day and Twelve Months Ago, and the Outlook for Business for the Remainder of the Year"; by M. L. Corey, secretary of the National Retail Hardware Association, on parcel post; by R. W. Hatcher, Milledgeville, on mutual fire insurance, and by R. R. Williams, Hardware editor of *The Iron Age*.

It will be observed that a great variety of trade topics are thus provided for, and in addition many other matters will doubtless come up for discussion through the medium of the Question Box.

National Retail Hardware Association.

The programme for the annual meeting of the National Retail Hardware Association to be held at the Pfister Hotel, Milwaukee, May 25 to 28, is nearly completed. Monday will be devoted to a meeting of the officers and Executive Committee. Tuesday forenoon will mark the formal opening of the convention, at which there will be welcoming addresses by Mayor David S. Rose and John H. Moss, president of the Milwaukee Merchants and Manufacturers' Association. Following this session there will be a reception and introduction of guests and delegates. On Tuesday afternoon reports from the officers and various committees will be read and there will also be an address on mutual fire insurance by Sharon E. Jones, Richmond, Ind.

On Wednesday morning addresses will be made by Robert Garland, Pittsburgh, president of the American Hardware Manufacturers' Association; by A. C. Bartlett, Hibbard, Spencer, Bartlett & Co., Chicago; R. A. Kirk, Farwell, Ozmun, Kirk & Co., St. Paul, Minn., and D. E. Brocklebank, Arthur, Ont., president of the Ontario Retail Hardware and Stove Association. In the afternoon there will be a report from the Suggestions Committee, followed by discussion and an address by George W. Hubbard, Flint, Mich. The Question Box will also come up for attention at this session and will be under the care of C. A. Peck, Berlin, Wis., and Harry S. Vincent, Fort Dodge, Iowa.

The forenoon on Thursday will be devoted to separate meetings of all committees, at which reports will be presented. Simultaneously there will be an executive session of all the Hardware association secretaries, at which Frank A. Bare, Mansfield, secretary of the Ohio Association, will preside. It is hoped to conclude the actual business of the convention on Thursday afternoon with the election of officers, selection of next place of meeting, &c., so that Friday can be devoted to a meeting of the newly appointed Executive Committee.

About 125 delegates have already been appointed to represent the different State associations at the gathering, and it is understood that nearly all of them will bring their wives. The Milwaukee retail Hardwaremen, as well as the Merchants and Manufacturers' Association, have the matter of entertaining the delegates in charge, and will doubtless provide a programme which will be exceedingly interesting and enjoyable.

New England Hardware Dealers' Association.

The organization meeting of the Board of Directors of the New England Hardware Dealers' Association was held at the rooms of the Boston Merchants' Association, Wednesday, the 28th ult. President Frank E. Peirson, Pittsfield, Mass., presided and the attendance was large and enthusiastic, with representatives from all the States of New England. Mr. Peirson delivered a statement of association policy which he hopes to pursue during his administration. Committees were appointed to commence work along the effective lines suggested in his address. It was decided to hold the 1910 convention at Boston. The sub-committee appointed to engage a permanent office in Boston will soon be ready to make announcement. A summer outing will be held this year as usual, and announcements will soon be made.

The delegates to the 1909 national convention at Milwaukee are D. Fletcher Barber, Boston, and Frank E. Stacy, Springfield, who, with Secretary Phelps, of the Connecticut Association; A. H. Abbe, New Britain, of the Joint Committee, and F. Alexander Chandler, Boston, of the national directorate, will give a New England delegation of five in all.

The New England Association—the oldest in the trade—has not made an especial effort in the past to build up rapidly in numerical membership, as it has been thought better to seek a slower and more conservative growth. It

is now decided to press a campaign for a larger proportion of the eligible membership, and this policy is being advocated and pressed through a campaign of education in the purpose of association work for trade betterment and harmony.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

STERLING VARNISH COMPANY, Pittsburgh, Pa.: Booklet referring to the history and present facilities and products of the company, especially Protective Coatings for structural steel.

WHITAKER MFG. COMPANY, Chicago: Illustrated catalogue No. 11, covering an extensive line of Hardware and Agricultural, Railroad and Factory Supplies, Mower Knives and Sections, Harvester Sickles, Rake and Thresher Teeth, Pitman Boxes, Link Chain Belting, Plow Shares, Haying Tools, Seeding Implements, Wrenches, Twist Drills, Taps and Dies, Mechanical Rubber Goods, &c.

ARTHUR T. RUTTER & Co., 256 Broadway, New York: Folder referring to Tubing, Sheets, Rods, Wire, Machine Screws, Rivets, Eyelets and Grommets, Drawn Shells, &c.

TENK HARDWARE COMPANY, Quincy, Ill.: Illustrated catalogue of special spring and summer goods for the season of 1909.

ROLLMAN MFG. COMPANY, Mount Joy, Pa.: Large illustrated circular referring to the Rollman Cherry Seeder and Meat and Food Choppers.

NIAGARA FALLS METAL STAMPING WORKS, Niagara Falls, N. Y.: Illustrated catalogue and price-list No. 12, referring to Embossed Sheet Metal Letters and Figures; also circulars of Compartment Boxes for this line, &c.

H. E. HESSLER COMPANY, Syracuse, N. Y.: Edition No. 17 for 1909 of illustrated catalogue styled "Stove Repairer and Tin Shop Supplier."

ENTERPRISE BED COMPANY, Hammond, Ind.: Illustrated catalogue of Enterprise Tent Cots.

ENTERPRISE ENAMEL COMPANY, Bellaire, Ohio: Illustrated pamphlet referring to Corona Enamel Ware.

CLAUSS SHEAR COMPANY, Fremont, Ohio: Clauss Primer, a clever booklet of illustrated advertising jingles founded on nursery rhymes.

R. H. SMITH COMPANY, St. Catharines, Ont.: Illustrated price-list catalogue of St. Catharines Saw Works, referring to Saws of all kinds, Trowels, Straw Knives, &c.

SARGENT & Co., New Haven, Conn., and 94-98 Centre street, New York: Insert page 1164a for catalogue, showing Sargent's Peerless Scriber for carpenters, &c.

THERE is an opportunity for Hardware merchants to stimulate their sales of Window and Door Screens, Wire Cloth, &c., by participating in the more or less general campaign that is being waged against insects that disseminate disease by carrying about germs and filth on their legs and wings. Chief among these, of course, is the common house fly. Health boards and medical societies are taking this matter up and educating the public to protect their homes and food throughout the summer and fall. Hardwaremen, therefore, should take advantage of the movement by talking and advertising Screens.

THE SALT LAKE HARDWARE COMPANY, Salt Lake City, Utah, which recently completed what is claimed to be the largest wholesale Hardware storehouse west of Chicago, is preparing to move its retail department into new quarters in the Union Block on Main street. When remodeled according to plans drawn the retail store, three stories and basement, will have a frontage of 50 ft. and a depth of 330 ft. About $100,000 will be expended in remodeling and refitting the store.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM BOCK-WALKER COMPANY, Battle Creek, Mich., which has succeeded to the Hardware business of C. F. Bock & Son.

FROM SPURGIN & SMITH, who have engaged in the Hardware business at Konawa, Okla.

FROM J. C. ROBERTS, Allendale, Mo., who has purchased the general Hardware and Saddlery business of Thompson Bros.

FROM RUTH & CLARK, who have bought the Hardware store of L. C. Clifford, Des Moines, Iowa.

FROM MCGREGOR HARDWARE COMPANY, Temple, Texas, which has been organized with a capital stock of $20,000 to succeed to the business of Brown-Arnold Hardware Company. W. F. McGregor is president of the company and R. L. Brown, general manager.

FROM A. S. LASCELLES & Co., Maritime Building, Battery Park, New York, who wish to extend their export business and would like to hear from firms whose goods are adapted for foreign trade, and who desire introduction in foreign markets.

FROM THE CLARK-HURLEY COMPANY, Willimantic, Conn., which has been incorporated with a capital of $12,000 and will handle Shelf and Heavy Hardware, Implements, Paints and Sporting Goods.

FROM FRANK T. CLARK, Norfolk, Va., who has for nine years been manager of the Frank T. Clark Company and is starting in business for himself. He will handle Builders' Hardware, Paints, Glass, &c., and a general line of builders' supplies.

As a means of promoting the sale of its Boss and Helva-Hard-Hitter Power Hammers the Novelty Iron Works, Dubuque, Iowa, is sending to the trade upon application a small dime savings bank. The plan contemplates the filling of the bank with small savings by the prospective buyer, who returns it to the company with his order for a Hammer. Upon its receipt, together with an additional sum of reasonable amount, the Hammer is shipped, and payments are completed in installments of savings, which the banks are designed to encourage. As a further inducement a prize of $5 is offered to the person ordering a Hammer and returning the savings bank containing the largest number of dimes.

THE HESS WARMING & VENTILATING COMPANY, 906-8 Tacoma Building, Chicago, has just secured from the War Department what is said to be the largest order ever given for Steel Clothing Lockers. The order calls for 7500 Lockers, with an aggregate weight of 1,000,000 lb. The contract price amounts to $60,946.80, and the shipment will fill 25 freight cars. The company is now preparing a new Locker booklet, which will be ready for distribution to the trade about June 1.

ABERCOMBIE & FITCH COMPANY, 57 Reade street, New York, has just issued an illustrated, descriptive catalogue referring to its extensive line of Fire Arms, Fishing Tackle, Camping, Tramping and Mountain Climbing Outfits, Clothing and Supplies. The book contains much valuable matter in the way of information and suggestions for campers, &c., and special attention is called to the company's terms of free delivery in different sections of the country.

Star Brand Copper Rivets.

The Coe Brass Mfg. Company is giving special attention to the sale of Star brand copper rivets and burs, the entire product of which is marketed exclusively by the U. T. Hungerford Brass & Copper Company, and which have been sold under this brand for over 50 years. When originally introduced this make of rivets superseded the ordinary rough hand made goods then in use. Among the characteristics of these rivets is that they are manufactured from selected copper, are clean cut, flawless and uniform, with extra large head and the star symbol on both rivet head and label. Pains are taken by means of a careful system of inspection to insure the distribution of none but perfect goods.

Southern Crescent Anvils.

The Southern Skein & Foundry Company, Chattanooga, Tenn., is manufacturing a line of anvils, the face of each being a solid piece of tool steel, thoroughly welded to the body of the anvil by a patented process. The steel is then accurately ground and tempered. The horn is covered with and its extremity is made entirely of tough, untempered steel. The body of the anvil is made from superior pig iron, and being, it is explained, more solid than wrought iron, the work forged receives the full force of the blow. The company warrants the face and horn of the anvil to be thoroughly welded to the body and not to separate.

Double Speed Wrench.

Leo M. Barrett, 601 K. of P. Building, Indianapolis, Ind., is putting on the market the Double Speed wrench

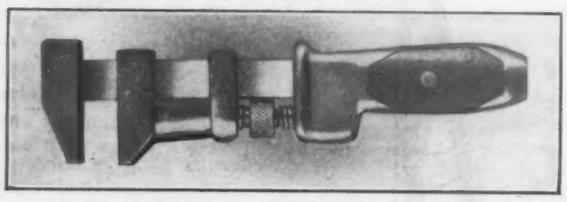


Fig. 1.—Double Speed Wrench.

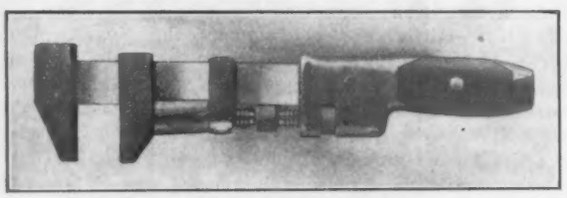


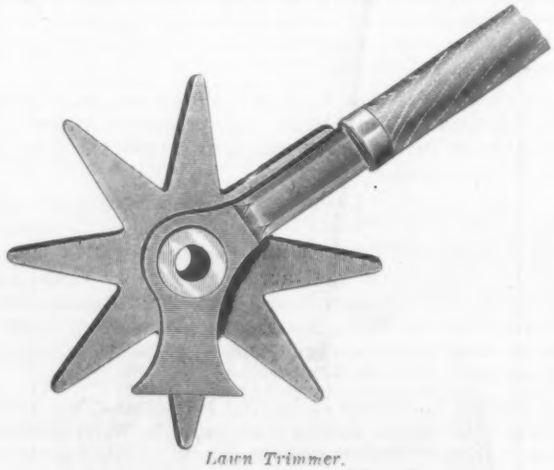
Fig. 2.—Double Speed Wrench with Lock Nut.

here illustrated with and without lock nut which is optional. It is described as made of the best material, and is offered in 6, 8, 10, 12, 15, 18 and 21 in. sizes. The principal feature to which attention is called is the screw which has a double engagement, right and left hand, one end in the movable jaw and the other in the handle casing. Thus two threads are working instead of one, and it is explained that one turn of the screw moves the jaw twice as far and fast as it would with one engagement. It is also claimed that there is no play or looseness, and, therefore, the jaws will fit much more snugly onto a nut. The wrench has a malleable, hollow, one-piece handle with wood filled grip. The wrench bar is of best quality drop forged steel, either hard, high carbon or case hardened as required, and extends clear through the handle engaging at the end where it is reinforced with shoulders of solid metal. By referring to the illustrations it will be seen that there is a raised shoulder in front of the handle, which protects it if the wrench is dropped. Thus the handle is said to be as durable as the rest of the tool.

THE SAMSON CORDAGE WORKS, Boston, Mass., in recognition of its twenty-fifth anniversary, is sending to the trade an attractive card calling attention to the important steps in the company's history. A feature of the announcement is a silver medal in the center of the card got up in commemoration of the occasion.

Lawn Trimmer.

The Bettcher Mfg. Company, Cleveland, Ohio, has recently put out the patented lawn trimmer here partially shown. For rust proofing the working parts are Sherardized. The trimmer has a 4½-ft. wood handle, the length of which enables the operator to trim a lawn with-



Lawn Trimmer.

out stooping or sitting. It may be operated when walking either backward or forward. In use the stationary part or shoe is pushed along the edge of the walk, the resulting revolution of the toothed wheel against the fixed member cutting the grass along the edge of walk or border.

Attachment for Combination Squares.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has recently brought out an attachment for combination squares, No. 289. It is made to fit the 12, 18 and 24 in. blades of the company's Nos.

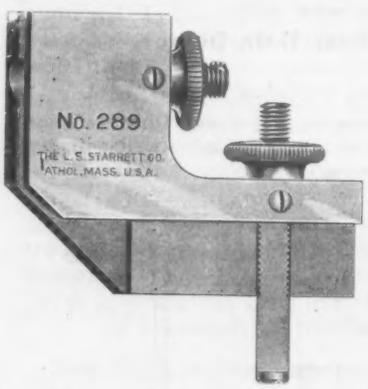


Fig. 1.—Attachment for Starrett Combination Square, No. 289.

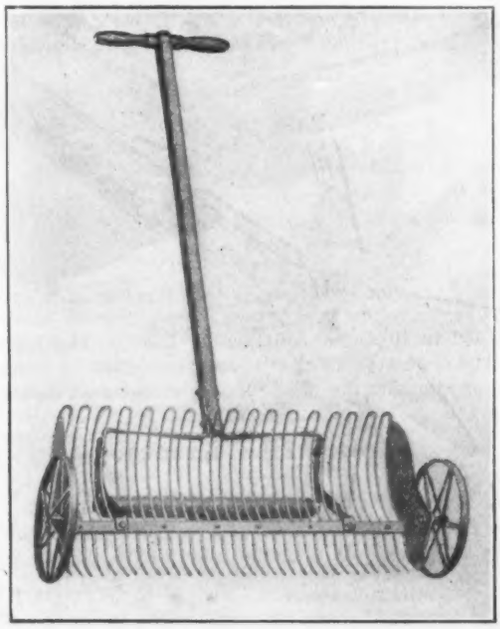
Fig. 2.—One Method of Using the Attachment.

11, 23 and 33 squares, and can be used with any of its regular rules as wide as 1 in. or with the flat steel square No. 21, for laying out keyseats, &c. Fig 1 is a reproduction of the attachment proper, Fig. 2 representing one of numerous uses, a variety of which are illustrated in the company's literature describing the attachment.

THE STAR EXPANSION BOLT COMPANY, 147 Cedar street, New York, has established a Southern sales agency with D. S. Miller, 1023 Maison Blanche Building, New Orleans, La., where a complete stock will be maintained of the company's line of Expansion Bolts, Screw Anchors, Toggle Bolts, Cable Hangers, Enameled Bridle Rings, Drill Holders, and Brick and Stone Drills. This arrangement is made with the object of giving prompt and satisfactory service and effecting a saving on behalf of users of the company's products in the South of time and freight charges.

The Aurora Lawn Rake.

Among the new goods recently brought out by the Richards Mfg. Company, Aurora, Ill., is the Aurora lawn rake shown in the accompanying illustration. It is designed to meet the demand for a quick and effective means for raking and removing grass and leaves. In gathering up the grass after a lawn mower it is especially serviceable. The rake is mounted on strong steel wheels, with the teeth set at a proper angle to take up the litter, and galvanized to prevent rusting. Ample adjustment is afforded to the wheels and rollers so that any angle desired may be quickly secured. The wheels are 10 in. in diameter, and the rake has a width of 30 in., weighing 240 lb. per dozen.



The Aurora Lawn Rake.

The Ideal Post Hole Digger.

The R. H. Vesey Mfg. Company, 198 South Clinton street, Chicago, has placed on the market the new post hole digger which is here illustrated. The particular features of this tool are that it is self-feeding, and so constructed as to remove all of the earth from the hole upon withdrawal. In Fig. 1, which shows the digger in its open position ready for boring, it will be observed that the cutting point is depressed at an angle which draws the tool downward, as it is revolved without pressure upon the handles. The diamond shaped point on the left cuts around the outer edge of the take-up blade, thereby loosening the earth in advance of the lower cutter. Its open form when cutting, as shown in Fig. 2, offers no impediment to the passage of rocks, roots, &c. When ready to remove the digger from the hole, the handle is given a half turn which throws the diamond point blade backward, closing the opening so that all of the earth above it is clearly removed at one lift. The cutting blades are made of high grade steel and the shaft is of tubing. The entire weight of the digger is 8 lb.

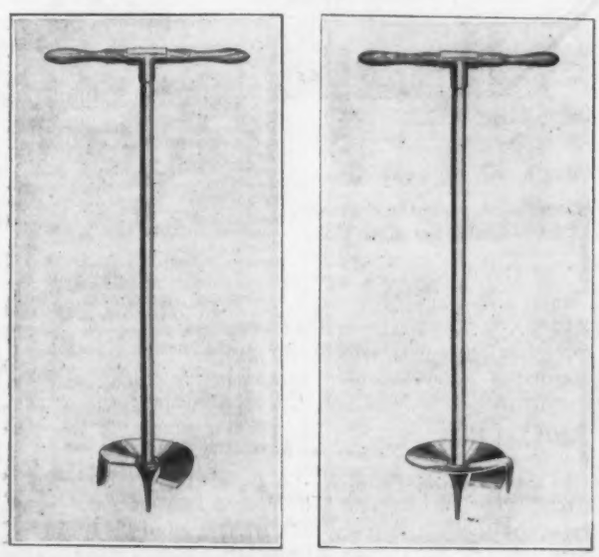


Fig. 1.—Open. Fig. 2.—Closed.

The Ideal Post Hole Digger.

Bowser's Wire Cloth Rack.

R. W. Bowser & Son, Renfrew, Pa., are putting on the market the wire cloth display rack here illustrated. It has a wooden frame and easel back, which can be folded out of the way if it is desired to hang the rack against a wall. Sitting on the floor it requires only 16 x 40 in. of floor space. It will accommodate nine different sizes of cloth, each roll being placed on a roller, which is operated by a small crank furnished with the outfit. When the rolls are in place they are kept from loosening by small rollers governed by springs, which prevent unwinding, but keep the cloth so that it can be conveniently unwound and cut off in any length and then wound up with a turn or two of the crank. When unrolling the cloth will not fly up, twist around or get out of shape. Opposite every roll is a card holder showing the size, with blank space for marking cost and selling price. The rack is said to be nicely finished, and is recommended as an attractive and convenient fixture, which will effect a considerable saving of time and labor in the store. Fig. 2 shows the device furnished for rewinding cloth onto the rack if it becomes damaged or gets out of shape in shipping, &c.

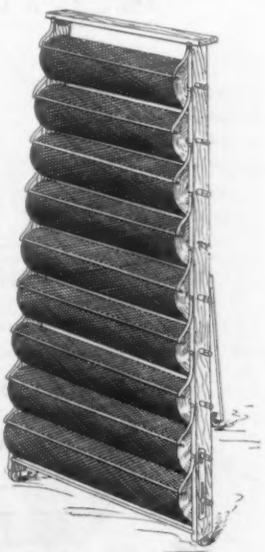


Fig. 1.—Bowser's Wire Cloth Rack.

Fig. 2.—Rewinding Cloth Onto Display Rack.

Fireless Cooker Vessel.

The Geuder, Paeschke & Frey Company, Milwaukee, Wis., has added to its line of enamel stamped ware the vessel here illustrated which is called the fireless cooker. It is coated with a lustrous finish smooth enamel, and has a tight fitting aluminum cover which is firmly held in place by a wire grip on each side. The cookers, which are made in three sizes, Nos. 4, 6 and 8, have capacities respectively of 3½, 5½ and 7½ quarts.

Fireless Cooker Vessel.

Sargent Peerless Scriber.

Sargent & Co., New Haven, Conn., and 94-98 Centre street, New York, have recently put on the market Sar-

gent's Peerless scriber, patent applied for, the illustration showing it half size. It is made of sheet steel, in both bright finish and nickel plate, and, as the sectional views in the bottom right hand corner indicate, will accommodate hexagon, oval or round pencils equally well. There is a broad point to prevent scratching plaster walls, fine woodwork, &c., which is also used as a protector to

Sargent's Peerless Scriber.

the pencil point. It can be moved out of the way, as desired. The sharp point is for compass work and for entering into quirks, moldings and similar places in scribing. In use the pencil is placed in the opening provided for it and in contact with the sliding lever, which holds any kind of pencil securely. The scribers are put up six in a box.

Automatic Magazine Tack Hammer.

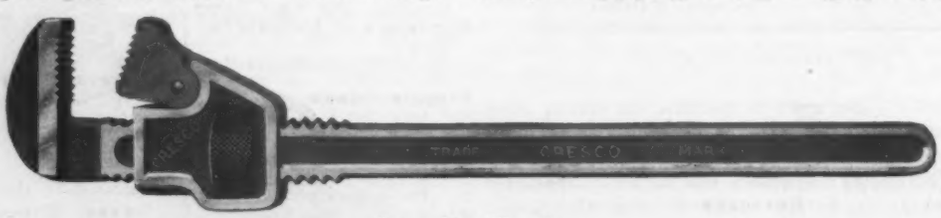
The Blair-Forth Mfg. Company, 137 High street, Boston, Mass., is putting on the market the Automatic Magazine tack hammer. It is said to be practically and substantially designed and built to meet all requirements. The handle is made of sheet steel, while the magnet is made of high grade steel, hardened as much as any hammer requires, and all the rest of the parts are tempered to spring temper. The hammer head is provided with pulling claws and is riveted to the steel handle. The illustration shows the transmission of the tacks from the handle by the magnetized portion of the head as operated by the pressure of the forefinger on the button and a counteracting spring. The hammer holds 50 tacks, can

Automatic Magazine Tack Hammer.

be loaded in 10 sec. and driven in 1 min. The hammer head is so constructed that it may be locked to the magnet, thus allowing the use of longer nails when desired.

Cresco Pipe Wrench.

The Crescent Forgings Company, Oakmont, Pa., has put on the market the Cresco pipe wrench, which consists of only six parts. It is made in 10, 14, 18, 24 and 36 in. sizes, taking pipe ⅛ to 1, ¼ to 1½, ¼ to 2, ½ to 2½ and



Cresco Pipe Wrench.

½ to 3½ in., respectively. The gripping parts are made of tool steel and hardened, including the thread, and the nut is case hardened. Every wrench is fully tested and guaranteed by the company, especial emphasis being laid on its being light, strong and moderately priced.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal. 5 bbl. lots.
Linseed, Western, Raw	.55 @56
State, Raw	.55 @56
City, Raw	.56 @57
Boiled, 1¢ ℔ gal. advance on Raw.	
Raw, Calcutta, in bbls	.75 @..
Lard, Prime, Winter	.81 @83
Extra No. 1	.52 @53
No. 1	.47 @49
Cotton-seed, Crude, f.o.b. mill	.34 @34½
Summer, Yellow, prime	5.55@5.60
Summer, White	5.90@6.00
Yellow, Winter	5.95@6.00
Tallow, Acidless	.56 @..
Menhaden, Brown, Strained	.33 @34
Northern Crude	@..
Southern	.23 @24
Light Strained	.33 @34
Bleached Winter	.36 @..
Cocoanut, Ceylon	℔ lb 6.65@..
Cochin	℔ lb 6.90@7.00
Cod, Domestic, Prime	.38 @..
Newfoundland	.40 @..
Red Elaine	.43 @47
Saponified	℔ lb 5¾@ 6¾
Olive, Yellow	1.40@1.50
Neatsfoot, Prime	.55 @56
Palm, Lagos	℔ lb 5.60@..

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	13½@14
Summer	12½@13
Cylinder, light, filtered	20½@21
Dark, filtered	18 @19
Paraffine, 905-907 sp. gravity	14½@15
903 sp. gravity	13½@14
883 sp. gravity	11 @11½
Red	13½@14

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer., floated	℔ ton 17.00@18.00
Off color	℔ ton 12.50@15.00
Chalk in bulk	℔ ton 3.00@ 3.40
China Clay, Imported	℔ ton 11.50@18.00
Cobalt, Oxide	℔ 100 lb 1.45@ 2.60
Whiting, Commercial	℔ 100 lb 45@50
Gilders	℔ 100 lb .52@ .64
Ex. Gilders	℔ 100 lb .56@ .68

Putty, Commercial—℔ 100 lb

In bladders	$1.70@2.00
In bbls. or tubs, 100 lb	1.20@1.45
In 1 lb to 5 lb tins	2.65@3.25
In 12½ to 50 lb tins	1.50@1.90

Spirits Turpentine—℔ gal.

In Machine bbls	.40 @40½
In Oil bbls	.39½@40

Glue—

	℔ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @19

Gum Shellac—

	℔ lb
Bleached, Commercial	.16 @16½
Bone Dry	.21 @21½
Button	.29 @30
Diamond I	@29
Fine Orange	.22 @23
A. C. Garnet	.16 @16½
G. A. L. Garnet	.15 @16
Kala Button	.12 @15
D. C.	@29
Octagon B	.23 @24
T. N.	.15 @16
V. S. O.	@27

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White and Red, Lead &c.—

	℔ lb
Lead, English white, in Oil	.10½@10¾
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	6¾
Dry and in Oil, 25 and 50 lb kegs	7
Dry and in Oil, 12½ lb kegs	7¼
In Oil, 25 lb tin pails	7¼
In Oil, 12½ lb tin pails	7¾
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	8¾
Red Lead and Litharge:	
In 100 lb kegs	7
In 25 and 50 lb kegs	7¼
In 12½ lb kegs	7⅞
In lots of less than 500 lbs, ¼¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	℔ lb
American, dry	5¼@ 5⅝
Red Seal (French process)	6¾@ 7
Green Seal	7¼@ 7½
German Red Seal (French process)	7 @7¼
Green Seal	7¼@ 7⅝
White Seal	8¼@ 9
French, Red Seal	8⅝@ 8¾
Green Seal	10⅝@10⅞

Dry Colors—

	℔ lb
Black, Carbon	6¼@10
Black Drop, American	3½@ 8
Black Drop, English	5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.30 @31
Blue, Prussian, Domestic	.28 @30
Blue, Ultramarine	.5 @15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.00@3.10
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Ocher, American	℔ ton $12.00@15.00
American Golden	4 @ 5
French	1¼@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	.10 @12
French	.12¾@13
German	.12 @13
American	8½@10
Red, Indian, English	5 @ 7
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.75@1.50
English	℔ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw, Powdered	3 @ 7
American, Raw	2¼@ 3
American Burnt and Pow'd	2¼@ 3
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .80@1.00
English	℔ 100 lb .90@1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, Turkey, Bnt. & Pow.	2¾@ 3
Turkey, Raw and Powdered	2¾@ 3
Burnt, American	2 @2½
Raw, American	2 @ 2½
Yellow, Chrome, Pure	12¾@14
Oxide Red, American	2 @ 7½
Vermilion, English, Imported	@70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic 33⅓%
North's 10%
Upson's Patent, ℔ gro., $29.90 ....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent 10%
Ives' Stop Bead Screws and Washers 10%
Taplin's Perfection 10%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs ....$2.00@$3.00

Anvils—American—
Eagle Anvils ....℔ lb @9 ¢
Hay-Budden, Wrought ....9½@9¾¢
Trenton ....℔ lb 9½@9¾¢

Imported—
Swedish Solid Steel Paragon, ℔ lb ....10@10½¢
Swedish Solid Steel Sisco, Superior, ℔ lb ....10@10½¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vice and Drill—
Millers Falls Co., $18.00 ....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co 10%

Augers and Bits—
Com. Double Spur 80%
Jennings' Patn., Bright .65&10@70%
Black Lip or Blued ...65@65&5%
Boring Mach. Augers 70%
Car Bits, 12-in. twist ....40&10%
Ford's Auger and Car Bits ....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list 50%
Russell Jennings' ....25&10&2½%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist 60%
Snell's King Auger Bits 50%
Swan's ....65&10@70
Swan's, Jennings' Pattern 50%
Wright's Jennings' Bits 50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ℔ doz., $26; No. 2, $18 ....60&10%
Ford's, Clark's Pattern ...60&5@60&10%
C. E. Jennings & Co., Steer's Pat. ..25%
Lavigne Pat., small size, $18.00; large size, $26.00 ....60&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dbl. Cut .....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz. .$5.50@6.00
Ames ....20&10%
Universal 20%

Ship Augers and Bits—
Ship Augers ....40&10@—%
Ford's ....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ....33⅓&7½%
Snell's 48%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled ....gro. $2.75@3.00
Unhdled, Shldered. ..gro. 63@66¢
Unhandled, Patent. .gro. 66@70¢
Peg Awls:
Unhandled, Patent. .gro. 31@34¢
Unhdled, Shldered. .gro. 65@70¢
Scratch Awls:
Handled, Com. ..gro. $3.50@4.00
Handled, Socket. gro. $11.50@12.00
Elmore Tool Mfg. Co.:
Tinners' and Brad Awls ....55&7%
Scratch Awls 60%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality ....$4.75@5.00
Second Quality ....$4.25@4.50
Double Bit, base weights:
First Quality ....$7.00@7.50
Second Quality ....$6.50@6.75

Axle Grease—
See *Grease, Axle.*

Axles— *Iron or Steel.*
Concord, Loose Collar ...4¼@4½¢
Concord, Solid Collar ....4½&5 ¢
No. 1 Common, Loose ...3½@4 ¢
No. 1½ Com., New Style. 4¼@4¾¢
No. 2 Solid Collar ....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12 ....70%
Nos. 13 to 14 ....70%
Nos. 15 to 18 ...70&10@70&10&5%
Nos. 19 to 22 ...70&10@70&10&5%

Boxes, Axles—
Common and Concord, not turned ....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent ....lb., 9½@10¢

Bait— Fishing—
Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ....20&5%

Balances— Sash—
Caldwell new list ....50&10%
Pullman ....50&10%

Spring—
Light Spring Balances. 60@60&5%
Chatillon's:
Light Spg. Balances ....50@50&10%
Straight Balances ....40@40&10%
Circular Balances ....50&10%
Large Dial 30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb. .... per lb., 2¼@2½¢

Towel—
No. 10 Ideal, Nickel Plate ..℔ gro. $8.50

Beam, Scale—
Scale Beams 40%
Chattillon's No. 1 ....30%
Chatillon's No. 2 ....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ......℔ doz. $1.50

Beaters Egg—
Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—
Blacksmith, Standard List:
Split Leather ....60&10@65%
Grain Leather ....50@50&10%

Hand— (Net Prices)

Inch..	6	7	8	9	10
Doz..	$500	5.50	6.00	6.50	7.50

Molders— (Net Prices)

Inch..	10	12	14	16
Doz..	$7.50	9.00	12.00	15.00

Bells— Cow—
Wrought Cow Bells 75%
Jersey ....75&10%
Texas Star 50%

Door—
Home, R. & E. Mfg. Co.'s ......55&10%

Hand—
Polished, Brass ....60@60&10%
White Metal ....60@60&10%
Nickel Plated ....50&10%
Swiss ....50&10%
Cone's Globe Hand Bells ......33⅓@35%

Miscellaneous—
Farm Bells ....lb., 2¼@2½¢
Church and School ....60@60&10%

Belting— Leather—
First Quality, Ex. Hy., Strictly Short Lap ....60&10%
Standard ....70&10@70&10&5%
Light Double ....75&10%
Cut Leather Lacing ....45@50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—
Competition (Low Grade), 70&10@75%
Standard ....60&10@70%
Best Grades ....40@50%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1908 list:
Chain, Parts, Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—
Common Wooden ......75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined 55%
Embossed 55%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co ....33⅓&10%

Bolts

Carriage, Machine, &c.—
Common Carriage (cut thread):
⅜ x 6 and smaller ......75&10%
Larger and longer ......70&10%
Common Carriage (rolled thread):
⅜ x 6, smaller and shorter, 75&10&5%
Phila. Eagle, $3.00 list ...80@—%
Bolt Ends, with C. & T. Nuts, 70&10%
Machine (Cut Thread):
⅜ x 4 and smaller ....75&10&5%
Larger and longer ....70&10&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch ...	3	4	5	6	8
Per doz..	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz.	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed ....60&10%
Spring ....70&10@70&10&10%
Shutter ....50&5@50&10&5%
Square Neck ....75@75&10%
Square ....70&10&10@80%
Ives' Mortise 10%
Ives' Wrought Metal 10%

Expansion—
F. H. Evans' Crescent ....40@60%
Richards Mfg. Co ....55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type ..60&10&5&2½%
Star, Wood Screw Type 40%
Star, Machine, Single Wedge 60%
Star, Machine, Double Wedge 60%
Steward & Romaine Mfg. Co.:
Style No. 13, Double 60%
Style No. 1, Single 60%
Style No. 100, Dbl. Jaw, Single ..55%
Lag Screw 66⅔%

Plow and Stove—
Plow ....65&5@70%
Stove ....85@85&5%

Tire—
Common Iron 80%
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84 ...80%
Eagle Phila., list Oct. 16, '84 82½%
Bay State, list Dec. 28, '99 ......80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ...80%
Eagle Phila., list Oct. 16, '84 ...82½%
Eclipse, list Dec. 28, '99 ....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ....80%
Norway Phila., list Oct. '84 ......80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ....80%
Phila., Eagle, list Oct. 16, 1884 ..82½%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Bung—
Borers Bung, Ring, with Handle:

Inch......	1¼	1½	1¾	2
Per doz. ..	$4.80	5.60	6.40	8.00
Inch			2¼	2½
Per doz			$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—
C. E. Jennings & Co 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ....15&10%
Perfection 40%
Seavey 45%

Braces—
Common Ball, American. $1.50@$1.75
Barber's ....50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 61, 166, 206, 614 ....50%
C. E. Jennings & Co ....50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat. ..50%
Millers Falls Drill Braces ......25&10%
P., S. & W. Co., Peck's Pat. ...60&10%

Brackets—
Wrought Steel ....80@80&5%
Bradley Metal Clasp. ..80&10@80&10&5%
Griffin's Pressed Steel ......75@75&10%
Griffin's Folding Brackets ......70&10%
Stanley's Pressed Steel 80%
Stanley's Folding Brackets ..70&10&5%
Taplin Victor Handy Egg Beater Bracket ....℔ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co ....75&20%
Wire Goods Co 75%

Buckets, Galvanized —
M'fr's list, price per gross. (10&7½&5&5%)

Quart..	10	12	14
Water, Light	$28.35	30.75	34.75
Water, Ex. Hvy.	46.85	49.35	53.25
Fire, Rd. Btm.	33.50	35.90	39.90
Well	37.35	41.35	45.35

Bull Rings—See *Rings, Bull.*

Butts— Brass—
Wrought, High List, Oct. 26, '06. 65%
Cast Brass, Tiebout's ....40&10%

Cast Iron—
Fast Joint, Broad ....40&10@50%
Fast Joint, Narrow ..40&10@50%
Loose Joint ....70&10@75%
Loose Pin ....70&10@75%
Mayer's Hinges ....70@70&5
Parliament Butts ....70@70&5

Wrought Steel—
BRIGHT. (Extra, 5@—)
Light Narrow, Light Reversible ....75&5%
Reversible and Broad. 75&10%
Loose Joint, Narrow, Light Inside Blind, &c. 75%
Back Flaps, Table Chest. 70%
BRONZED.
Light Narrow, Loose Pin ..55%
Light, Loose Pin, Ball Tip. 65%
Broad 55%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel..... 4¾¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B..... .52@55¢
G. D..... per M. 34@35¢
F. L..... per M. 40@42¢
G. E..... per M. 48@..0¢
Musket ..... per M. 62@63¢

Primers—

Berdan Primers, $2 per M. 20&5%
Primer Shells and Bullets.. 15&10%
All other primers per M. $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50..... 10&5%
38 C. F., $7.00..... 10&5%
22 cal. Rim, $1.50..... 10&5%
32 cal. Rim, $2.75..... 10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball.... $1.40
Central Fire..... 25%
Target and Sporting Rifle. 15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting..... 50%
Rim Fire, Military..... 15&5%

Casters—

Bed ..... .65&10@70%
Plate ..... .60@60&5%
Philadelphia ..... 70&10@75%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing)..... 70&10&10&5%
Steel Gem (Roller Bearing)..... 70%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list... 40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	½	⅝
$7.45	4.80	3.85	3.25	3.10	3.00

⅞ to 1 — 1⅛ to 1¼ inch.
$2.90 — 3.00
Lower prices in cask lots f.o.b. factory.
German Coil..... .70&5%
German Pattern Coil:
6-0 to 1..... .70&10&5%
2 and 3..... .60&10&10@70%
4, 5 and 6..... .50&10@50&10&5%

Halter—

Halter Chains..... .60&5@60&10%
German Pattern Halter Chains, list July 24, '97..... .70&5%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6¼—6-3, Straight, with ring. $26.00
6½—6-2, Straight, with ring. $27.00
6½—8-2, Straight, with ring. $30.00
6½—10-2, Str'ght, with ring. $33.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c..... .70&10@—%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... .60&10&5@60&10&10%
Brass 65%
Safety and Plumbers' Chain. 75%
Gal. Pump Chain.... lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and [illegible] 35&2½@40%
Triumph Dog..... 60&10@60%
Brown Halter and Coil..... 50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain.... 70%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set. 8¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set. 8¢

Chalk—

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 50@55¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools..... 55%
Youths' Chests, with Tools..... 40%
Gentlemen's Chests, with Tools.. 30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

Standard List. . 80&10@80&10&10%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10..... 25&7½%
Socket Framing No. 15..... 25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White & Co..... 30@30&5%

Tanged—

Tanged Firmers..... .30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181.. 25%
L. & I. J. White Co..... 25&5%

Cold—

lb.
Cold Chisels, good quality. .13@15¢
Cold Chisels, fair quality. .11@12¢
Cold Chisels, ordinary.... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels..... 50&5%

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck..... 40
Beach Pat. each $8.00..... 35&5%
Blacksmiths' 25
Cincinnati Chuck Co.:
Independent 4-jaw Reversible..... 35%
Empire 25
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws..... 35
Universal, Com. Style Jaws..... 40%
Combination, Reversible Jaws... 25%
Combination, Com. Style Jaws.. 40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks..... 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, .. 25%
Positive Drive..... 40%
Planer Chucks..... 20%
Standard 45%
Drill Press Vises..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21..... 35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35.. 25%
Independent Iron, Nos. 18 and 318. 35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15.. 40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill... 50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—

Carriage Makers', Star, P., S. & W. Co. 50%
Resly, Parallel..... 33⅓&10%
Hammer & Co.:
Adjustable ..... 20&5%
Carriage Makers' H. P. Screw. 40&5%
Myers' Hay Rack..... 50%
Lineman's Swedish Neverturn..... 65%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,

Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%

Sidewalk—

American Fork & Hoe Co.:
Star. ℔ doz., Socket, $4.00; Shank $3.50
Shank, ℔ doz., X 7½, $3.50; Shank, X 8..... $3.75

Cleavers, Butchers'—

Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Ball Bearing Horse, each.....$7.50
Stewart's New Model Sheep Shearing Machine, each.$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25% off

Clips, Axle—

Regular Styles, list July 1, '05, 80&80&10%

Cloth and Netting, wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs..... 70%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods..... .75@75&5%

Conductor Pipe,—

L. C. L. to Dealers:

Gal. Steel.	Charcoal.	Copper.
Northeastern:		
70&10@1—%	50&10&7½%	50&10%
Eastern:		
75@1—%	50&10&7½%	50&10%
Central:		
75@1—%	60%	50&10%
Northwestern:		
75@1—%	60%	50&10%
Western:		
70&10@1—%	50&12½%	50&5%
Tennessee:		
70&10@1—%	50&12½%	50&10%
Southern:		
70&10@1—%	50&12½%	50&5%
Southwestern:		
70@1—%	50&5%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coppers' Tools—

See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21½¢; lighter than 3 lb. to pair..... .23½¢

Cord— Sash—

Braided, Drab..... .lb. 35¢
Braided, White, Com., Nos. 8 to 12, 22¢; No. 7, 22½¢; No. 6, 23½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India..... .lb., 11@11½¢
Cotton Sash Cord, Tw'ted. 18@20¢
Patent Russia..... .lb.... 20¢
Cable Laid Russia..... .lb... 21¢
India Hemp, Br'd'd..... .lb... 21¢
India Hemp, Twisted... lb. 13@14½¢
Patent India, Twisted.. .lb... 17¢
Pearl Braided, cotton, No. 6, ℔ lb. 20½¢; No. 7, 19½¢; Nos. 8 to 12, 19½¢, in 12 doz. to 100 doz. lots.
Eddystone, Braided, Nos. 6 to 12, 26¢; 7, 25½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to10..... ℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100.. $2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord..... 50¢
Massachusetts, White... ℔ lb 40¢
Massachusetts, Drab... ℔ lb 45¢
Phoenix, White, Nos 8 to 12.... 27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length..... .90@—%
Short Length..... .30&20@—%
Hendryx Standard Wire Picture Cord ..... 90&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—

Grain ..... .50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ℔ gro. White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks..... $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16..... $3.00
Suremark, Black, $2.25; Blue, Red and Yellow..... $2.50

Crooks, Shepperds'—

American Fork & Hoe Co.:
Montana ..... ℔ doz. $4.50

Crow Bars—See *Bars, Crow.*

Cultivators—

American Fork & Hoe Co.:
Victor Garden..... 50&10%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847 ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor..... ℔ doz. $3.00
Wm. Rogers & Son..... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—

American 30%
Nos. 401 402 403 404 405 406 407
Each ... $6 $7 $10 $12 $25 $30 $60
Enterprise:
Nos..... 8 10 12 22 32
Each ...$2 $3 $2.75 $4.50 $6 25@25&7½%
No. 202..... $1.50..... 40&7½%
P., S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant..... ℔ doz. 40@50%
Nos.. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
New Triumph No. 605, ℔ doz. $24.00. 40%
Russwin Food, No. 1, $24.00; No. 2, $27.00; 3, $42.00..... 45&10&10%
$15.00 $18.00
Enterprise Beef Shavers..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—

All Iron, Cheap...doz, $1.25@4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.50
Split Handle Post Hole Diggers, ℔ doz., $7.50
Hercules Pattern, ℔ doz..... $9.50
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ..... .$1.50@1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
C. & C. Ratchet..... 25%
Reversible Ratchet Die Stocks.... 25%
Goodell Automatic Drills. 50&10&60&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $8.16.
Millers Falls Automatic Drills, 33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved ..... 40@40&5%
Ratchet, No. 012..... 40@40&5%
Ratchet, Celebrated..... 40@40&5%
Ratchet, Whitney's, P., S. & W., 40&10@50%
Whitney's Adjustable, No. 10, $12.00, 33⅓%

Twist Drills—

Bit Stock..... .70@70&10%
Taper and Straight Shank, 65@65&10%

Drivers, Screw—

Screw D'ver Bits, per doz. 45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's Screw Drivers, Handles and Ferrules 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible ..... 55&7½%
Standard Neverturn..... 66⅔%
Star ..... 75&5%
Screw Driver Bits..... 25%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers.... 40&10%
Gay's Double Action Ratchet..... 33⅓%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540 ..... 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern..	*75&10&5%*	*50&10%*
Eastern..	*80%*	*50&10%*
Central..	*80&10&5%*	*50&10%*
Northwestern..	*80&10&5%*	*50&10%*
Western ..	*80&5%*	*50&5%*
Tennessee..	*80&5%*	*50&10%*
Southern ..	*75&10%*	*50&5%*
Southwestern..	*75&10&2½%*	*50&5%*

Terms.—2% for cash. Factory shipmeets generally delivered.
Note.—Lower prices are quite general owing to market irregularities.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4..... 30%
Sizes 1½, 2½, 3½, 5, 6... 60&10%
No. 26..... 50%
No. 24..... 25%
Copper Elbows..... 50%

Elbows, Stove Pipe—

Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue..... 40&10&10%
Reeves, Dover, Flat Crimp..40&10&5%

Emery, Turkish—

	¼ to 4:	5½ to 220:	Flour.
Kegs ..... lb.	*5 ¢*	*5¼¢*	*3¼¢*
¼ Kegs..... lb.	*5¼¢*	*5¾¢*	*3¾¢*
¼ Kegs..... lb.	*5½¢*	*6 ¢*	*4 ¢*

10-lb. cans, 10 in case....6½¢ 7 ¢ 6 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢
NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, emon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ₱ gro.; $1.08.....10%
Titan, ₱ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, ..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ₱ doz., $36.00.....40&10%
Lane's, ₱ doz., $36.00.....40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Disston's Superfine.....60%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

Peck, Stow & Wilcox Co.:

In.....	15	17	19	21	24	
	$4.00	4.40	4.75	5.50	6.50	....30%

Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
American Fork & Hoe Co.:
Iowa Dig-Ezy Potato.....70&5%
Hay, Regular, 3-tine.....45&20&12½%
Hay, Regular, 4-tine.....60&7½&5%
Champion, Hay.....60&12½%
Acme, Hay.....60&20%
Manure, Regular, 4-tine.....65&5%
Manure, Regular, 5 and 6 tine...70%
Champion, Manure.....65&5%
Columbia, Manure.....70%
Acme, 4-tine.....60&10&5%
Round Shoulder Header, 4-tine..65%
Champion, Header.....65%
Dakota, Header.....65%
Kansas Header.....65%
Wood, Barley.....35&5%
Steel, Barley.....66⅔%
Columbia, Spading.....70&7½&5%

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.....	*1*	*2*	*3*	*4*	*6*
Each....	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 5.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $1.00; 2, $1.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $1.30; 2, $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 50%

Grease, Axle—
Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand and Foot Power, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....33⅓%
Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 .....40%
Disc Grinders, each, $2.50.....40%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....70&10@—%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔@5%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ₱ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—
Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro.$1.30@$1.40
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz...45¢
Chapin-Stephens Co.:
Carving Tool.....30&30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle ... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%

W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz, R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
} 50%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00.. 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₱ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ₱ doz., 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%

Extra 5&10% often given.

Hangers— Garment—
Pullman Trouser, ₱ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net 50%

Joist and Timber—
Lane Bros. Co.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—
Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70&75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%

Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'f'chs.	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.25*	*1.90*	*3.50*
Latches only.....	*.70*	*.75*	*.35*

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz....@$1.55
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₱ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros. Pivot, Ball Bearing 40%
Lawson Mfg. Co. Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 999.....₱ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ₱ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro, ...$12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k. ₱ gr, pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list February 10, 1908:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....50&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%
Extra, 5&10%

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *1½ to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 ¢* }

Screw Hook and Eye:
⅜ to 1 inch.....lb. 6¼¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢

10&7½&5%

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	*15*	*16*	*17*	*18*
Galv. Open....	*$35*	*$39*	*$42*	*$46*
Jap. Open...	*26*	*28*	*31*	*35*
Galv. Funnel...	*43*	*48*	*52*	*56*
Jap. Funnel....	*33*	*36*	*39*	*43*

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 102.....each $1.05
Steel Mortar, No. 103.....each $1.35

Hoes— Eye-

Scovil and Oval Patterns, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60&5%

Handled—

Cronk's Weeding, No. 1,$2.00; No. 2,$2.50
Star Double Bit.....$2.50
American Fork & Hoe Co.:
Regular, Cotton.....75&10&5&2½%
Crescent, Cultivator.....75&2½%
Mattock, Senior.....70%
Mattock, Junior.....70%
Sprouting.....50%
Tobacco, Harper's.....66⅔&15&10%
Warren.....55&10&10&5%
Ivanhoe.....65&15&10%
Cultivator, B B 6.....70&10&10&5%
Cultivator, B B 6½.....70&10&10&5%
Weeding, Acme.....72½&10&2½%
Scuffle, Lightning.....60&5%

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz, $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos, 118, 119, Sure Grip.....50%
Superior.....40%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $18.00; ℔ doz.....$2.00

Trace and Rein—

Fernald Double Trace Holder, ℔ doz, pairs.....$1.25
Dash Rein Holder, ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10@80%; Ceiling..75&10@80%
Columbian Hdw. Co., Gem.....75&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; V Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Wrought Iron—

Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton.....doz.$1.25@$1.50
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench.
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Whiffletree.....lb.5½@6¢
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft.6@6¼¢
3-ply Guaranteed....ft.8½@9¢
4-ply Guaranteed....ft.9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9c
Fair Quality.....ft.10@11¢

Irons— Sad—

From 4 to 10.....lb.3½@3¾¢
B. B. Sad Irons.....lb.3¼@3½¢
Mrs. Potts', cents per set:

	Nos. 50	53	60	65
Jap'd Caps	.86	93	96	93
Tin'd Caps	.91	88	1.01	98

New England Pressing..lb.3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....doz.60@65¢

Irons, Soldering

See *Coppers.*

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hennenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..33⅓

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..40%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
American Fork & Hoe Co.:
Easy Cut, ℔ doz No. 10 C H...$2.10
Easy Cut, ℔ doz., No. 10 B C H.$2.20
Acme, ℔ doz.....$2.35
Dent, ℔ doz.....$2.35
Adjustable, Serrated, ℔ doz.....$1.90
Serrated, ℔ doz.....$1.85
Yankee, No. 1 C H.....$1.35
Yankee, No. 2 C H.....$1.15

Drawing—

Standard List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz.,$5.00@5.50
Iwan's Sickle Edge.....℔ doz, $9.50
Iwan's Serrated.....℔ doz. $10.00

Miscellaneous—

Farriers'.....doz.$2.60@3.55
Wostenholm's.....℔ doz, $3.00@3.25

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro.$1.25@1.40
Carriage, Jap., Drive, all sizes, gro.35@40¢
Door, Mineral.....doz.65@70¢
Door, Por. Jap'd.....doz.70@75¢
Door, Por. Nickel..doz.$2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co., Melting and Plumbers'.....25%
P., S. & W.....40&10%
Reading.....60%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular—

Regular, No. 0.....doz.$3.50@4.00
Side Lift, No. 0....doz.$4.00@4.50
Hinge Globe, No. 0.doz.$4.00@4.50
Other Styles.....40@40&10%

Bull's Eye Police—

3-inch.....$3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws.....doz.35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$4.50

Leaders, Cattle—

Small.....doz.50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.50*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.; White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Crescent.....10%
Automatic Gravity Metal Sash, ℔ gro., $149.58.....10%
Window Ventilating.....10%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%
Taylor Mfg. Co., Perfect Ventilating, ℔ doz.....$0.75@$1.00

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—

Reisinger Invincible Hand Power....℔ doz, $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	57.00
Champion Rotary Banner No. 1	57.00
Standard Champion No. 1	50.00
Standard Perfection	27.00
Cincinnati Square Western	33.00
Uneeda American, Round	33.60

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Apple-wood.....doz.45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee.....20@25%
Shell and Corn.....25&10%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%

$2.50	3.50	10.00	15.00	33⅓%
No. 1.	2	3	4	

Lippincott's:

No.	1	2	3	4	
	$2.50	3.50	10.00	15.00	33⅓%

Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@ 20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade	*$3.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing.....50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%

Nails—

Wire Nails and Brads, Miscellaneous.....85&5@85&10%
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	℔ lb, net, 12¢
Coleman	13	12	12	11	11	net ℔ lb
New Haven	23	21	20	19	18	℔ lb, net, 12¢
Livingston	19	18	17	16	16	10%
Western						℔ lb 8½¢

Jobbers' Special Brands, per lb.9¢

Picture—

	1¼	*2*	*2¼*	*3 in.*
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters—

Brass.....30%
Plated.....30&10%

Nippers—

See *Pliers and Nippers.*

Nipples—

Standard Nipple Co.:
Wrought Pipe Nipples.....80%

Nuts— *Blank or Tapped.*

Cold Punched:	*Off list.*
Square	*5.40¢*
Hexagon	*6.00¢*
Square, C., T. & R.	*5.80¢*
Hexagon, C., T. & R.	*6.60¢*
Hot Pressed:	Off list.
Square	*5.90¢*
Hexagon	*6.40¢*

Oakum—

Best.....lb.6½¢
U. S. Navy.....lb.6 ¢
Navy.....lb.5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10@70%
Railroad.....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, etc.....60@60&10%
Malleable, Hammers' improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Packing Box—

Herculever. ℔ doz., $24.....30%

Can Openers—

	Per doz.
Sprague, Iron Handle	*30@35¢*
Sprague, Wood Handle	*40¢*
Sardine Scissors	*$1.75@3.00*

Can and Bottle Openers, ℔ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty.....$0.75

Egg—

Hartigan Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....16@17¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb, 80¢.....25%

Miscellaneous—

American Packing....lb. 7@10 ¢
Cotton Packing.....lb.16@25 ¢
Italian Packing.....lb. 9@10¢
Jute.....lb. 4@4¼¢
Russia Packing.....lb. 9@10¢

Pails, Water, Well, &c.—

See *Buckets.*

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List.....75&5@75&10%
Edwards, Royal Blue.....75%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.85*	*0.95*	*1.15*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft...2½¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....3½¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll, 58@70¢
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.....$55.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton. $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—

Goodell Co.:

Family Bay State	℔ doz. $15.00
Improved Bay State	℔ doz. $36.00
New Lightning	℔ doz. $7.00
Turn Table '98	℔ doz. $6.00
White Mountain	℔ doz. $5.00
Bonanza Improved	each $7.50
Dandy	each $10.00
Eureka Improved	each $20.00
New Century	each $20.00
Ranger	each $30.00

Livingston Nail Co.:
Daisy ..... ℔ doz. $4.00
Little Star ..... ℔ doz. $5.00
Rocking Table ..... ℔ doz. $6.20
Reading Hardware Co.:
Advance ..... ℔ doz. $1.00
Baldwin ..... ℔ doz. $1.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25

Orange—
Goodell Co., Success ..... each $20.00

Potato—
Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—
(List Jan., 1908.)
List ..... 75&10%
Cronk's Handled Garden Mattock, ℔ doz., $3.00 ..... 33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—
Eastern Prices:
Standard, 2-6 in. 68%
Extra Heavy, 2-6 in. 71%
Fittings, Standard and Heavy 80¾%
Extra, 10 & 10&5%

Pipe, Merchant—
Carloads to Consumers:

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in..				
⅜ in.....				
½ in.....				
¾ to 6 in....				
7 to 12 in....				

See Trade Report

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$5.90	$6.90
6 in., Uniform Color..	6.40	7.40
7 in., Uniform Color..	7.40	8.40

Planes and Plane Irons—
Wood Planes—
Bench, first qual. ..... 30@30&5%
Bench, second qual. .... 40@40&5%
Molding ..... 25@25&5%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes
Chaplin's Iron Planes 60%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ℔ doz. $7.50

Plates—
Felloe ..... lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—
Never-Break ..... 75&10%

Pliers and Nippers
Button Pliers .... 75&5@75&10&5%
Gas Burners, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45, $1.50.
Gas pipe.. 7 $2.00 | 8 $2.25 | 10 $2.75 | 12-in. $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers 70%
Wire and Cutting Pliers 75%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.... 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor.. 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston & Sons:
Shafting Levels ..... 60&10%
Pocket Levels ..... 60&10%
Plumbs and Levels ..... 60&10%
Track Level and Gauge ..... 60&10%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers.... lb. 9 ¢
½-lb. papers..... lb. 9½¢
¼-lb. papers..... lb. 10 ¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Ladd Co.:
Putzade Liquid, ℔ gro., ½ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ℔ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $1.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2, gal pails, ℔ doz., $24.00; each, $2.50; 1 lb cans, each ..... 75¢
Glasbright Powder, bbls., ℔ lb..20¢

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.20; gro.$12.00
2 qt. Square..doz.$1.50; gro.$15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 6 ft., 46¢; 6½ ft., 48¢; 7 ft., 50¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned ..... 30&10%

Powder—
Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
Discount to the trade, 10%.
NOTE.—Prices vary according to territory.
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)..	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—
Fruit, Wine and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail, Etc.—
Cyclops 50%
Elmore Tool Mfg. Co.:
Drop Forged Tack Pullers 10%
Nail Pullers 40%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co. Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Taylor Mfg. Co., Sampson Tack, ℔ doz. $0.40

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz...	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in..... 17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.. .20@21¢

Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel, Eagle, ℔ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in., ... 27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ℔ doz. ..... 19¢
Common Sense ..... ℔ doz. 20¢
Merit ℔ doz., 2¼ in. ..... 37¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in. ..... 20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&10&5@80
Wood Pumps, Tubing, &c.... 50%
Barnes Dbl. Acting (low list) 50%
Barnes Pitcher Spout 80%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) ..... 50&5%
Flint & Walling's Fast Mail (low list) ..... 50&5%
Flint & Walling's Tight Top Pitcher 80%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) } 50%
Myers' Power Pumps }
Myers' Spray Pumps }

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	1	2	3	4
	$5.00	6.00	7.00	8.00

30@30&5%

Cup Leathers—Per 100:

Inch....	2½	3	3½	4
	$5.00	7.00	9.00	12.00

30@30&5%

Punches—
Saddlers' or Drive, good, doz.50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes) .... doz.$3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Elmore Tool Mfg. Co.:
Machinists' Center 40%
Tinners'; Solid, 50%; Prick 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 40&10%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail ..... 2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft. $3.45
O. N. T., ℔ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
Trolley, No. 301, ℔ ft. ..... 9¢
McKinney's:
Hinged Hanger Track, ℔ ft., 11¢. 60&5%
1 x 3-16 Track ..... 55&7½%
Myers' Stayon Track ..... 60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 59 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
American Fork & Hoe Co.:
Lawn, ℔ doz., No. 21, $2.50; No. 20 ..... $2.25
Cronk's:
Steel Garden: Champion, ℔ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ℔ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Jumbo Lawn, 36-tooth.... ℔ doz. $5.00
Lawn Queen, 20-tooth.... ℔ doz. $2.85
Lawn Queen, 24-tooth.... ℔ doz. $3.00
Paragon, 20-tooth ..... ℔ doz. $2.65
Paragon, 24-tooth ..... ℔ doz. $2.75
Steel Garden, 14-tooth.... ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros.' ..... 70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
John Engstrom Swedish 65%
Sharp Shaver 60%
Fox Razors, ℔ doz., No. 42, $24.00; No. 44, $20.00; No. 82, Platina, $36.00. } Dis. 50%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P., 33¼%; 2904 PN., 33⅓%; 0924 N., 33¼%; 92084 N., 33⅓%; 002904 PN., 33¼%; 802 N., 33⅓%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action ..... 95¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber...$2.00
Automatic *$4.00*
Hammerless *$4.50*

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz.85@95¢
Blair's Rings..per gro.$5.50@$6.00
Blair's Ringers..per doz.65@70¢

Rivets—
Copper Rivets and Burrs....50%
Tinners' and Miscellaneous Rivets ..... *80@80&10%*

Bifurcated and Tubular—
Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@63¢.
Tubular, per doz. boxes, 50 count, 60@68¢; 100 count, $1.12@$1.26.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... *lb. 8¼@8½¢*
Sisal, 7-16 in. diam. and larger: Pure ..... *lb. 6¾@7¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure ..... *lb. 7¼@7½¢*
Sisal, Tarred, Medium Lath Yarn: Pure ..... *lb. 6¼@6½¢*
Cotton Rope: Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger.15@16¢
Common, ¼-in. and larger..7½¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. and up, lb. ..... *6@6½¢*
Thread, No. 2, ¼-in. and up, lb. ..... *5½@6¢*

Wire Rope—
Galvanized ..... *$7½&2½%*
Plain ..... *55&2½%*

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60&5%
Ivory ..... 25&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Unson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws: 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames. 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth. 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 40%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Hand Ice Saws 45%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws. 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws. 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws. 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand.... 45%
Compass, Key Hole, &c. 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Chromol Blades 35%
Hack Saw Frames 30%
Simonds, 25%; The Best, 35%.
Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete ..... 40&7½%
Goodell's Hack Saw Blades....40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Star Hack Saws and Blades....15&10%
Sterling Hack Saw Blades..30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..15%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades, Hand Frames, Power Blades 40%

Scroll—
Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00.. 15&10%

Scales—
Union Platform, Plain. $2.10@2.20
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wag- 50%

Scrapers—
Box, 1 Handle ..... doz. $1.85@2.10
Box, 2 Handle ..... doz. $2.35@2.50
Ship ... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box..30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@ 2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood .... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—
Lag, Cone Point ..... 80&10%
Coach, Gimlet Point ..... 80&5%
Hand Rail ..... 70&10@75%

Jack Screws—
Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—
Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—
Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—
List July 23, 1903.
Flat Head, Iron .... 87½&65@.. %
Round Head, Iron .... 85&65@.. %
Flat Head, Brass .... 80&65@.. %
Round Head, Brass .. 77½&65@.. %
Flat Head, Bronze .... 75&65@.. %
Round Head, Bronze. 72½&65@.. %
Drive Screws ..... 87½&65@.. %

Scroll Saws—
See *Saws, Scroll.*

Scythes—
	Per doz.
Plain Grass, Cutting Edge Polished	$6.25@$6.50
Clipper, Bronzed Web	$6.50@$6.75
Solid Steel, Web and Backs Polished	$7.00@$7.25
Bush, Weed and Bramble, Painted	$6.50@$6.75
Grain, Painted, Cutting Edge Polished	$8.25@$8.50
Clipper Grain, Bronze Web	$8.50@$8.75

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Fray's Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—
American Fork & Hoe Co.:
Rake, Shovel and Hoe, ₩ doz. sets, No. 3 P F $7.25

Sets, Nail—
Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Elmore Tool Mfg. Co. 30%
Mayhew's ..... ₩ gro. $9.00
Snell's Corrugated, Cup Pt.... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt.... ₩ gro, $7.50

Rivet—
Regular list ..... 75@75&10%

Saw—
Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut..... ₩ doz. $7.50
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut.... $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Royal, Hand ..... ₩ doz. $4.50
Seymour Smith & Son's 65%
Taintor Positive ..... ₩ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30 .....
₩ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz. $1.50
Mounted Kitchen Sand Stone, ₩ doz. $1.50
Natural Grit Carving Knife Hones, ₩ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz. $1.50
Quick Edge Pocket Knife Hones, ₩ doz. $2.50
} 50%

Skate—
Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—
Iron ..... doz. $1.25
Wood ..... doz. $2.00
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ₩ doz. $9.00 ..... 15&10%
Seymour Smith & Son's 50%

Shears—
	7	8	9 in.
Cast Iron..			
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel.. 60&10&5%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel ..... 50&10&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles ..... 70&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—
Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%
Acme Cast Snips ..... 40@45&5%
W. H. Compton Shear Co., Forged Steel Handles 35%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel. 50%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. 50%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%
W. H. Compton Shear Co., Dropped Forged Steel 35%
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears.... 33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ₩ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners ..... 75&10%
Wood Handle Pruning Shears.... 40%

Sheaves—Sliding Door—
Reading 40%
R. & E. list 15%

Sliding Shutter—
Reading list 40%
R. & E. list 15%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Union, League, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders. 40&5%
Arrow, Smokeless Powders. 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.
Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.05	$5.05
Dixie, 10 x 14 in.	4.25	5.45
Dixie, 7 x 10 in.	5.25	6.70

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₩ keg $3.90

Shot—
25-lb. bag.
Drop, up to B $1.70
Drop, B and larger 1.95
Buck 1.95
Chilled 1.95
Dust 2.30

Shovels and Spades—
Association List..40&7½@40&10%
Avery Stamping Co. 40%

Snow Shovels—
Long Handle ..... $2.50@$2.75
Wood and Mall, D Handle, $2.65@$2.90

Sieves and Sifters—
Hunter's Imitation, gro $9.50
Hunter's Genuine, per gro.. $12.00

Sifters, Ash—
Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ₩ doz. $39.00

Sieves, Seamless Metallic
—Per dozen.—

Mesh	14	16	18	20
Iron Wire	*$1.05*	*1.05*	*1.19*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... doz. $0.90@0.95
Mesh 20, Nested .... doz. $1.00@1.05
Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 24 to 24 x 50 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list 60%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... 70@70&10%
Steel ..... 35@40%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless.. 60&7 tens.
Victor A, Noiseless. 60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—
Grass Scythe ..... 50@50&5%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous
German Silver ..... 60@60&5%

Tinned Iron—
Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00
Atlas Mfg. Co.:
Tea Spoons, ₩ gro. ..... 50¢@55¢
Table Spoons, ₩ gro. ..... $0.90@$1.00

Springs— Door—
Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 39 in. ..... ₩ doz. $1.00

Carriage, Wagon, &c.—
1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 .... per pair. 45@47¢
1½ x 3 x 28 .... per pair. 68@71¢

Sprinklers, Lawn—
American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₩ doz. $12.00
Enterprise ..... 25@30%
Hero Fruit Jar Co., ₩ doz. $4.50
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—
Nickel plated.. } List Jan. 5, 1900.
Steel and Iron. } 60@—%
Rosewood Hdl. Try Square and T-Bevels ..... 40&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, 60&10%

Squeezers, Lemon
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75
Victor, ₩ gro. $9.00

Staples—
Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $2.05; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones, Axe—
Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—
Pike Mfg. Co., Glass Cutters' Stones and Supplies 40%

Stones, Oil, &c.—
Pike Mfg. Co., 1907 list: ₩ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $1.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
} 35%

India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, R'g'lar. ₩ lb. 8¢
Hindostan No. 1, Small.. ₩ lb. 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ₩ lb. 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢
} 33⅓%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.50
Green Mountain S. S. ℔ gro. $7.00
Extra Indian Pond S. S. ℔ gro. $8.00
No. 1 Indian Pond S. S. ℔ gro. $7.50
No. 2 Indian Pond S. S. ℔ gro. $5.00
Leader Red End S. S. ℔ gro. $5.00
Quick Cut Emery ℔ gro. $10.00
Pure Corundum ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat. $11.00
Emery Scythe Rifles, 4 Coat. $13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ℔ gro., $12.00 $12.00 33⅓%
Lightning (Artificial), ℔ gro., $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%
Seymour Smith & Son's 60%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stevens Co. 20%

Straps— Box—

Acme Embossed, case lots. 20&10&10%
Cary's Universal, case lots. 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points . . doz. 55¢
All Steel Socket . . . doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ℔ doz., $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Goshen Sweeper Co.:	Per doz.
Gilt Edge	$27.00
Superfine	26.00
Majestic	24.00
Select, Nickeled	22.00

National Sweeper Co.:
National Queen, Nickeled $27.00
Martha Washington, Nickeled 25.00
Monarch, Japanned 20.00
Perpetual, Japanned 18.00
Streator Metal Stamping Co.:
Model E. Sanitaire $25.00
Eureka 15.00
Streator Majestic, Nickeled 24.00
Streator Conqueror, Japanned 22.00

NOTE.—Leading Manufacturers give the following rebates from list prices: 50¢ per dozen on three-dozen lots: $1 per dozen on five-dozen lots; $2 per dozen on ten dozen lots

Tacks, Finishing Nails, &c.

American Carpet Tacks. 90&25@—%
American Cut Tacks . . 90&25@—%
Swedes' Cut Tacks . . 90&30@—%
Swedes' Upholsterers' . 90&35@—%
Gimp Tacks . . . . . 90&35@—%
Lace Tacks . . . . . 90&35@—%
Trimmers' Tacks . . . . 90&30@—%
Looking Glass Tacks . . . . . 65@—%
Bill Posters' and Railroad Tacks, 90&40@—%
Hungarian Nails . . . . . 80@—%
Finishing Nails . . . . . 70@—%
Trunk and Clout Nails . 75&5@—%
NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&6 tens@—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
50	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin . . . . 50@—%
Patent Leather . . . . . 25@30&5%
Steel . . . . . 33⅓&5%
Chesterman's . . . . . 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkins:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@33%
Wichusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ¾-inch and larger per 100 lb. . . . . $2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. . . . . 30@35%

Ties, Bale—Steel Wire—

Sing'e Loop . . . . . 82½&10%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Haying—

Myers' Hay Tools 50%

Ice Tools—

Gifford-Wood Co. 15%

Miniature—

Smith & Hemenway Co.'s. Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools. . . . 35&5%
Simond's Improved 33⅓%
Simonds' Crescent 30%

Ship—

L. & I. J. White 25%

Torches—

Hammers, Engine, ℔ doz. $1.50

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro. . . . $11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida . . . . . 75@10%
Newhouse 50&5%
Hawley & Norton 65&10%
Victor 75@75&10%
Oneida Community Jump 70&5%
Stop Thief 60%
Tree Trap 60%
Hector 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine), ℔ doz.:

	Crate lots.	Small lots.
No. 1, Rat	$11.50	$14.50
No. 3, Rat	$5.75	$6.50
No. 3½, Rat	$4.70	$5.25
No. 5, Mouse	$2.25	$3.00

Animal Trap Co.:
Out o' Sight, Mouse, ℔ doz. $0.60
Out o' Sight, Rat, ℔ doz. 1.20
Easy Set, Mouse, ℔ doz. .35
Easy Set, Rat, ℔ doz. .85
Out o' Sight Chockers, ℔ doz. holes .12
Out o' Sight, Tin, 5-hole, ℔ doz. traps .75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Forged Steel Garden Trowels, in bulk, net ℔ gro. $5.50
In 1 doz. boxes ℔ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ℔ doz. $16.00
Grocery ℔ doz $15.00
McKinney Trucks each, net $10.00
Model Stove Trucks ℔ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized	$67	$79	$91	$103
	10&7½			
	&5&5%			

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls . 21@23¢
No. 12, ¼ and ½-lb. Balls . 19@21¢
No. 18, ¼ and ½-lb. Balls . 16@18¢
No. 24, ¼ and ½ -lb. Balls . 15½@17½¢
No. 36, ¼ and ½-lb. Balls . 15@17¢
Chalk Line, Cotton ½-lb. Balls . . . . . 24@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. . . . . 8½@19¢
Cotton Wrapping, 5 Balls to lb.. according to quality . . 13½@19¢
American 2-Ply Hemp, ¼ and ½-lb. Balls . . . . . 12½@15¢
American 3-Ply Hemp, 1-lb Balls . . . . . 13½@16¢
India, 2-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine) . . 7½@9¢
India 3-Ply Hemp, 1-lb. Balls . . . . . 7½@9¢
India 2-Ply Hemp, 1½-lb. Balls, ... 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls . . . . . 9@11¢
Mason Line, Linen, ½-lb. Bls. 17¢
No. 2½ Mattress, ¼ and ½ lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply . . . . B 6¢; A 7½¢

Vises—

Solid Box . . . . . 60@60&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co., 40&5%; Slide 65%
Fisher & Norris Double Screw, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00 15&10%
Fisher-Brooks Bench Vises, No. 0, $3.80; No. 1, $5.90; No. 2, $8.25; No. 3, $10.50; No. 4, $13.50 15&10%
Fulton Mach. & Vise Co.:
F. & R. Double Swivel Machinists' 40%
Star, Solid Jaw, Machinists' 40%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Parallel Bar 15%
Perfect, 15%; Lightning Grip 15%
Merrill's 25%
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Rock Island 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, ℔ doz. $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
F. & R. Double Swivel Coachman's 40%
Star Solid Jaw Woodworkers' 60%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Fulton Machine & Vise Co., Combination Pipe 70%
Holland's Combination Pipe. 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe 25%

Wads— *Price per M.*

B. E., 11 up . . . . . 60¢
B. E., 9 and 10 . . . . . 70¢
B. E., 8 . . . . . 80¢
B. E., 7 . . . . . 80¢
P. E., 11 up $1.00
P. E., 9 and 10 . . . . . 1.25
P. E., 8 . . . . . 1.50
P. E., 7 . . . . . 1.50
Ely's B. E., 11 and larger . $1.70@1.75
Ely's P. E., 12 to 20 . . . $3.00@3.25

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled . . . . . 45&10%
Ground . . . . . 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs . . . . . $2.75@$3.00
White Enameled Ware:
Maslin Kettles . . . . . 65&10%
Covered Wares:
Tinned and Turned . . . . . 35&10%
Enameled . . . . . 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
El-an-ge 60&10%
Iron Clad Ware 70&10%
Lava and Volcanic, Enameled. 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles 65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd 60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles 65&5%
Solid Steel Ketties 60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone. . . . 40@40&10%

Washboards—

No.	℔ doz.
800—Brass King, Single Surface, Open Back	$2.80
862—White Hen, Spiral Grimp Glass	$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.35
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back	$2.80
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
797—Jewel, Single Zinc, Pail Size.	$1.25
St. Louis Washboard Co.	
Ben Hur, Brass, Open Back	$2.50
Brass Key, Open Back	$2.75

Washers—Leather, Axle—

Solid . . . . . 90@90&10%
Patent . . . . . 90@90&5%
Coil: ⅞ 1 1¼ 1¼ inch.
9¢ 10¢ 11¢ 14¢ per box.

Iron or Steel—

Size bolt. . . . 5-16 ⅜ ½ ⅝ ¾
Washers 3.50 4.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ℔ 100 lb. discount; in 100 lb kegs, add 10¢ net ℔ 100 lb; in 5 or 10 lb boxes, add 50¢ net ℔ 100 lb.; in 1 lb boxes, add $1.00 net ℔ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish . . . . . lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co. 30&2%

Sash—

Per net ton . . . . . $22.50@—

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 . . . . . 72&10&7½%
10 to 18 . . . . . 72½&10&10%
19 to 26 . . . . . 75&10&10&2½%
27 to 36 . . . . . 77½&7½%
Galvanized:
6 to 9 . . . . . 72½&10%
10 to 14 . . . . . 72½&10&5%
15 to 16 . . . . . 72½&10&5%
17 to 18 . . . . . 72½%
19 to 26 . . . . . 70&5&2½%
27 to 36 . . . . . 65&10&10%
Coppered:
6 to 9 . . . . . 65&10&10%
10 to 14 . . . . . 70&10&5%
15 to 18 . . . . . 65&10&10&10%
19 to 26 . . . . . 70&5&2½%
27 to 36 . . . . . 72½&10&2½%
Tinned:
6 to 18 . . . . . 67&10&10%
Brass . . . . . 15¾¢ lb., base
Copper . . . . . 15¼¢ lb., base
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned . 75@75&10%
Brass and Copper . . . 70@70&10%
Retailers' Assortments, per box. $1.90@$2.10
Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods . . . . . 90&10%
Brass Wire Goods . . . . . 90&10%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50.
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural . . . . 80&10@80&10&5%
Alligator or Crocodile. 70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S . . . . . 45@45&5%
acme 60&10%
Alligator Pattern, 70%; Bull Dog. 70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut 50&5%
Combination Black 50&5%
Merrick Pattern 50&5%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes' Genuine Hammer Handle. 40&10&5&5%
Coes' "Mechanics'" . . 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 70%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots 50&10%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W. 50&10%; full cases 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain 50%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle. 40&10&5%
Other Wrenches 50%
Vulcan and Agrippa Chain 50%
Whitaker Machinists' 50&10%
Wizard Adjustable Ratchet 50%

Fruit Jar—

Bent. P. Forbes, Triumph, ℔ gro. $7.50; per doz. $0.90

Wrought Goods—

Staple Hooks, &c., list March 17, '02 . . . . . 90@—%

Zinc— *(Cask lots at mill.)*

Sheet . . . . . per 100 lb., $6.75

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.70¢
1½ to 4 in. x ¼ to 5-16	₩ lb 1.90¢
Rods—⅝ and 11-16 round and square	₩ lb 1.90¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	1.95¢
3 in. x 5-16 in. and ⅜ in.	2.15¢
1½ to 2½ in. x ¼ in.	1.95¢
1½ to 2¾ in. x 5-16 in. and thicker	1.85¢
1 to 1¾ in. x 5-16 in.	1.95¢
1 to 1¾ x ⅜ in.	2.00¢
⅝ x ⅜ in.	2.15¢
⅝ x ½ in.	2.25¢
⅝ x ⅝ in.	2.30¢
½ x 3-32 in.	2.80¢

Tees:	
1 in.	2.25¢
1¼ in.	2.05¢
1½ to 2½ in.	1.90¢
3 in. and larger	2.05¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.15¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.30¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.70¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.80¢	2.90¢
Nos. 18 to 21	₩ lb 2.85¢	3.00¢
Nos. 22 and 24	₩ lb 2.95¢	3.10¢
No. 26	₩ lb 3.00¢	3.10¢
No. 28	₩ lb 3.10¢	3.40¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 11½@14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ lb 2.85¢
Nos. 22 to 24	₩ lb 3.10¢
No. 26	₩ lb 3.40¢
No. 28	₩ lb 3.75¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb .5 75¢
No. 26	₩ lb .6.25¢
No. 28	₩ lb .7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd.
No. 24	₩ 100 sq. ft. $3.80	4.75
No. 26	₩ 100 sq. ft. 2.90	3.95
No. 28	₩ 100 sq. ft. 2.55	3.70

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.15
IX, 14 x 20	7.40
A. Charcoal:	
IC, 14 x 20	$5.30
IX, 14 x 20	6.30

American Coke Plates—Bessemer-

IC, 14 x 20 107 lb	$4.20
IX, 14 x 20	5.30

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8 10
IX 20 x 28 with an 8 lb. coating	10.00

Seamless Brass Tubes—

List December 4, 1905. Base price 19¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 20¾¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¼ ₩ lb

Copper Wire—

Base Price, Carload lots mill 14¼¢

METALS—

Tin—

Straits Pig ₩ lb 30¾@31¼¢

Copper—

Lake Ingot	₩ lb 13¾@14 ¢
Electrolytic	₩ lb 13½@13¾¢
Casting	₩ lb 13¼@13½¢
Sheet Copper Hot Rolled, 16 oz.	₩ lb 18 ..¢
" " 14 "	" " 19 ..¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in wide and under, 1¢ advance over Cold Rolled.

Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.

Bottoms, Pits and Flats ₩ lb 21¢ basis

Planished Copper, 1¢ ₩ lb more than Polished.

Spelter—

Western ₩ lb 5¾@5¾¢

Zinc.

No 9, base, casks, ₩ lb 7.25¢ | Open ₩ lb 7 75¢

Lead.

American Pig	₩ lb 4½@4¾¢
Bar	₩ lb 5½@5¾¢

Solder.

½ & ½, guaranteed	₩ lb 20 @20¼¢
No. 1	₩ lb 17½@17¾¢
Refined	₩ lb 15½@15¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb ..@10¢
Halletts	@9½¢
Other Brands	@9 ¢

Bismuth—

Per. lb $1.90@$2.00

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..74¢

Rods & Wire	Base Price 38¢
Sheets	Base Price 34¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

		—Cents—
Copper, Heavy and Wire	₩ lb	10.25@10.75
Copper, Light and Bottoms	₩ lb	9.50@ 9.75
Brass, Heavy	₩ lb	7.25@ 7.50
Heavy Machine Composition	₩ lb	9.75@10.25
Clean Brass Turnings	₩ lb	6.75@ 7.25
Composition Turnings	₩ lb	8.00@ 8.50
Lead, Heavy	₩ lb	...@ 3.50
Tea Lead	₩ lb	...@ 3.20
Zinc Scrap	₩ lb	...@ 3.00

ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND CLASS MATTER